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Affected by Association: Having a family member with legal/police problems and body mass index in a multi-ethnic cohort of women transitioning through menopause

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Affected by Association: Having a family member with legal/police problems and body mass index in a multi-ethnic cohort of women transitioning through menopause

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Abstract

Affected by Association: Having a family member with legal/police problems and body mass index in a multi-ethnic cohort of women transitioning through menopause

Background: Millions of Americans encounter the legal system each year. The health implications of having legal or police problems have been well-documented, especially among incarcerated populations. Missing from the literature, however, is an insight into the health of those closest to the individuals facing legal and/or police problems—their family.

Methods: We examined the association between a specific network stressor, family legal/police problems (FLPP) and body mass index (BMI) (calculated as weight in kilograms divided by the square of height in meters) over 11 years in 3,302 women from Study of Women Across the Nation (SWAN). SWAN is a multi-ethnic longitudinal cohort study of women transitioning through menopause. Data were analyzed with generalized linear mixed modeling techniques.

Results: Of the 3,302 women included in these analyses, 506 women reported FLPP at baseline. Compared with women who did not report FLPP at baseline, women who did report FLPP had higher BMIs by 1.20 (95% CI: 0.49 – 1.90) kg/m^2 in models adjusting only for demographic factors. After controlling for behavioral and health factors (smoking, physical activity, daily caloric intake, diabetes, menopause status, and depression), women who reported FLPP still had higher BMIs by 0.96 (95% CI: 0.14 – 1.77) kg/m^2. Within stratified categories of age, race, and education, BMI increases yearly by 0.14 (95% CI: 0.13 – 0.15) kg/m^2; however, increase in BMI over time was not different by FLPP report at baseline ($\beta = 0.03$, 95% CI: -0.01 – 0.06). Sensitivity analyses confirmed the results from our primary analyses.

Discussion: The results of this study demonstrate that the reach of the legal system extends well beyond the alleged offender and into the lives of the women that care about them. Our findings show that mid-life women who report having a family member with legal or police problems at baseline have higher BMI at study start and that their elevated BMI remains stable across the length of follow-up. Future studies should seek to better understand and characterize health disparities in this population and identify ways in which communities and health care professionals can better serve their unique health needs.

Affected by Association: Having a family member with legal/police problems and body mass index in a multi-ethnic cohort of women transitioning through menopause

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Contents

Introduction

In 2013 alone, the nation's state courts reported 94.1 million newly filed, reopened, and reactivated cases—traffic violations, civil, domestic relations, criminal, and juvenile cases (1). It is estimated that 65 million U.S. adults have had some documented encounter with the criminal justice system (2). Glaze and Kaeble report that over two million people are incarcerated in the U.S. on any given day (3). Millions of Americans encounter the legal system and police each year. These encounters vary in setting, consequence, and severity of offense; however, one could argue that each problem comes with some measure of stress for the focal respondent and others involved.

The literature well-documents disparities at every level of the legal system: civil trials, policing, representation, sentencing, and incarceration (4-8). The same populations most impacted by the legal system—persons of low socio-economic status and racial/ethnic minorities—are also more likely to be at risk for adverse health outcomes such as cardiovascular disease, diabetes, and obesity (9-11). Studies have characterized the health needs of individuals who encounter police and/or the legal system, mostly focusing on the health of incarcerated individuals (12-14). Largely missing from the literature, however, is an insight into the health of those closest to the individuals facing legal and/or police problems—their family.

Having legal and/or police problems affects not only those directly impacted but also the people supporting them emotionally, materially, and socially. In cases of abuse and drug use, families and communities may find some benefit in the correction of offensive members. However, even in these cases, the distraction or potential absence of the offender from the variety of roles that they fill could create a greater burden (15).

Financial burdens of legal involvement may be shared or even fall solely upon other family members or partners. In the case of incarceration, an absence may claim one of two or more essential income streams of a family unit (16). Partners of incarcerated persons, facing material hardship, may be forced to take on extra jobs and/or reach out to family elders. In any case, the stress of financial strain may permeate throughout the family unit. Family members and friends of persons in legal or police trouble may also encounter the stigma of criminality. This stigma could also manifest in loss of social capital (17). For these reasons and others, loved ones of individuals facing legal or police problems could be severely stressed by even brief events—specifically women (18, 19).

Research suggests that women are more vulnerable to sharing in the stress of those within their social networks (20). In a 1987 cross-sectional study of 7,000 persons, men and women reported comparable levels distress from sources of self-stress such as separation or divorce and ill health; however, women reported significantly higher levels of distress from their social networks. Network stressors refer to life events that do not occur to the focal respondent but to someone deemed "important" in the individual's network. The added burden of network stress due to having a family legal or police problems could be an important risk factor to study in women.

Few studies have investigated the health states of women who have loved ones directly impacted by legal issues (21). To our knowledge, only three studies employ quantitative, epidemiologic methods (22-24) to characterize specific health risk factors and/or outcomes. Here, we investigate the association between a specific network stressor, family legal/police problems (FLPP), and body mass index in a large, nation-wide, multi-ethnic sample of women transitioning through menopause.

Methods

Study Design

The Study of Women's Health Across the Nation (SWAN) is a multi-site, longitudinal study of multi-ethnic women transitioning through menopause (25). SWAN began in 1994 with the recruitment of 16,142 middle aged (40 – 50) women at sites in Boston, MA, Pittsburgh, PA, Oakland, CA, Los Angeles, CA, Detroit, MI, Newark, NJ, and Chicago, IL. Women were initially recruited to participate in a cross-sectional, population-based study using survey methods for representative samples. Eligible participants (criteria described below) were subsequently enrolled into a longitudinal study. Enrollment for the longitudinal study began in 1996, and the baseline visit was completed by all sites by December 1997. The baseline study collected data from 3,302 women (1,550 White, 935 Black, 286 Hispanic, 250 Chinese, and 281 Japanese). SWAN women completed annual follow-up visits, which included physical measures (height, weight, blood pressure, etc.), a fasting blood draw, and both interviewer- and self-administered questionnaires. Participants were also given menstrual calendars to complete monthly over the following year. The data presented here were collected from 1997 to 2008. All study procedures were approved by the respective site IRB boards, and all women consented to participation in the study.

Participants

Women participating in the cross-sectional screener were selected based on the following eligibility criteria: residence within the geographic limits set by the clinical site, proficiency in English or an additional language designated by the site (Chinese, Japanese, or Spanish), age 40 – 55 years, and self-identification with one of two

racial/ethnicity groups studied at the clinical site. Out of the 16,142 women who participated in the cross sectional survey, 3,302 women (1,550 White, 935 Black, 286 Hispanic, 250 Chinese, and 281 Japanese) were enrolled into the longitudinal study. Eligibility for the longitudinal study was more restricted and included the following: age 42 – 52, having a uterus and at least one intact ovary, and a reported menstrual period within the past three months without taking hormone treatments such as birth control, estrogen, or progesterone replacement.

Family Legal/Police Problems (FLPP)

At baseline and subsequent visits, SWAN participants were asked questions about adverse events. An adverse events index included potentially upsetting events that could happen in the participants' lives or in the lives of the family and/or friends. Here, we investigate one particular question posed below.

Primary Study Question

> *"During the last 12 months, have you experienced…[a] family member [who] had legal problems or a problem with police?"*

Women could choose, "No," "Yes," "Yes, not at all upsetting," "Yes, somewhat upsetting," or "Yes, very upsetting." Going forth, we will refer to this exposure as "family legal/police problems" or FLPP. We compared women who reported FLLP within the past year at baseline (at all levels of "upsetting") to women who reported having no FLPP within the past year at baseline ("No").

Covariates

Covariates included demographic variables, behavioral variables, and health-related variables. Demographic variables included race/ethnicity with options for White, Black, Chinese, and Japanese. Notably, data from women who self-identified as Hispanic was purposefully excluded in some years, resulting in non-random missing data. Thus, Hispanic women were not included in the analysis. Age and education, assessed as a three-level variable (high school or less, some college, and college degree or higher) were also included as demographic covariates. All demographic variables were measured at baseline. Behavioral variables used in the analysis include current smoking status, physical activity, and daily caloric intake. Current smoking status, physical activity, and daily caloric intake are included in the models as time-varying covariates. Physical activity was measured as a scale, the details of which are published in a previous work (26). The physical activity scale is based on an adaptation of the Kaiser Physical Activity Survey. Responses to physical activity questions were Likert scale-based, scored 1 – 5, and averaged across questions within two domains—active living and sports. The two score domains were summed to create a physical activity scale ranging from 2 – 10. Daily caloric intake was measured by a modification of the 1995 Block Food Frequency with additional considerations for ethnic diets (27, 28). Wellness-related variables included menopause status, diabetes, and depression. All wellness-related variables are time-varying. Menopause status was categorized as pre-menopause, early perimenopause, late perimenopause, and post-menopause, while diabetes was reported as "Yes" or "No". Depression is a dichotomous variable derived from the Center for Epidemiologic Studies Depression Scale (CES-D) (29). CES-D scores greater than or equal to sixteen indicate depression.

Body Mass Index

Weight and height were measured at each study visit by SWAN research staff. Body mass index (BMI) was calculated from these measures. Weight was measured using either a digital balance or balance beam scale and reported to the nearest 0.01 kg. Height was measured with either a stadiometer or a folding wooden ruler, and women were asked to remove their shoes during data collection. BMI was calculated by dividing the weight in kilograms by height in meters squared (kg/m^2).

Statistical Analyses

Descriptive statistics were performed for all variables and stratified by report of FLPP at baseline. T tests were used to compare continuous, normally distributed variables. Comparisons of categorical variables were assessed by chi-squared tests. Generalized linear mixed modeling (GLMM) techniques were used to investigate longitudinal associations between FLPP at baseline and BMI. We included random intercepts in the model, which allow us to apply a subject-specific interpretation to model parameters. An autoregressive correlation structure was chosen to reflect the decreasing correlation of BMI measurements overtime. A robust estimator was added to these analyses to correct for potential error in correlation structure. Models were selected based on a priori knowledge of potential confounders in the SWAN study. Exploratory mixed models were also employed assess potential differences in effect by race, education, and depressive status. We also performed a sensitivity analysis including only women who reported FLPP at baseline and women reported having no FLPP—neither at baseline nor throughout follow-up. GLMM techniques were repeated for these analyses.

Results

Descriptive Statistics

Characteristics of the 3,302 women included in this study are displayed in Table 1. Of these women, 506 (15.3%) reported having FLPP within the past twelve months at baseline. Women were aged 45 – 55 with a mean age of 46. Age was not significantly different in women who reported FLPP compared with women who did not report FLPP ($p = 0.38$). Notably, women who reported FLPP at baseline were less likely to have a college degree (25.9% v. 46.3%). Women who reported FLPP at baseline were also more likely to be Black (38.1 v. 26.5%) and less likely to be Chinese (5.7% v. 10.0%) or Japanese (6.5% v. 13.2%). Diabetes, current smoking, and depression were more prevalent in women who reported FLPP at baseline. Women with baseline FLPP consumed, on average, 211 more kcal per day than women who did not report FLPP at baseline. Body mass index (BMI) was higher in women reporting baseline FLPP (27.1 kg/m^2 v. 29.4 kg/m^2).

Generalized Linear Mixed Modeling

Reporting FLPP at baseline was associated with increased BMI in minimally adjusted models as well as fully adjusted models. Generalized linear mixed model effects are shown in Table 2. Adjusting for demographic variables only (age, race, education), women who report FLPP at baseline have increased BMI by an average of 1.20 (95% CI: 0.49 – 1.90) kg/m^2. Race and education were also significantly associated with BMI in the model. Model 2 includes a time variable and a main effect interaction with time. Within stratified categories of age, race, and education,

BMI increases yearly by 0.14 (95% CI: 0.13 – 0.15) kg/m^2. Increase in BMI over time was not different by FLPP report at baseline (β = 0.03, 95% CI: -0.01 – 0.06). Model 3 additionally adjusted for health and behavior (current smoking, daily caloric intake, physical activity, menopause status, and diabetes). Even with this additional adjustment, women who reported FLPP at baseline had higher BMI by 0.96 kg/m^2 (β = 0.96, 95% CI: 0.15 – 1.78). Consistent with the previous model, change in BMI over time was not different between women who reported FLPP and women who did not report FLPP (β = 0.03, 95% CI: -0.03 – 0.09). Additionally, smoking status, daily caloric intake, physical activity, menopause status, and diabetes were associated with BMI in the model. Model 4 additionally adjusted for depression. Women who reported FLPP at baseline had higher BMI by 0.96 kg/m^2 whether the women were depressed or not (β = 0.96, 95% CI: 0.14 – 1.77).

In exploratory models, we assessed potential FLPP by race interactions, FLPP by education interactions, and FLPP by depression interactions. The association between FLPP status at baseline and BMI was did not differ within strata of race, education, or depressive status and none of the interaction terms were statistically significant.

Sensitivity Analysis

We conducted a generalized linear mixed sensitivity analysis including only women who reported FLPP at baseline (n = 485) and women who did not report FLPP at any time during the study (n = 663). Reporting FLPP at baseline was significantly associated with higher BMI in each model assessed, reflecting the results

of our primary analysis. In Model 1, adjusted for demographic characteristics only, the BMI of women reporting FLPP at baseline was nearly 2 kg/m^2 higher than women who did not report FLPP ($\beta = 1.73$, 95% CI: 0.87 – 2.60). When time was added to the model (Model 2), not only did women who reported FLPP at baseline have higher BMI ($\beta = 1.73$, 95% CI: 0.76 – 2.52) but also experienced greater increase in BMI over time ($\beta = 0.05$, 95% CI: 0.01 – 0.09). In the fully adjusted Model 4, women who reported FLPP at baseline had a higher average BMI by 1.37 kg/m^2. These women also had higher rates of BMI gain ($\beta = 0.06$, 95% CI: 0.00 – 0.12).

Discussion

This cohort includes mid-life female family members that could be mothers, wives, aunts, or cousins of those affected by the legal system. The results of this study demonstrate that the reach of the legal system extends well beyond the alleged offender and into the lives of the women that care about them. Our findings show that mid-life women who report having a family member with legal or police problems at baseline have higher BMI at study start and that their elevated BMI remains stable across the length of follow-up. Notably, this trend is true for women within each strata of race/ethnicity, socioeconomic status, level of physical activity, daily caloric intake, and depressive state. These findings suggest that, despite physical activity level or daily calorie consumption, having a family member in legal or police trouble puts mid-life women at increased odds of having a higher BMI than women with no FLPP. Moreover, this increased BMI is stable over time—whether or not women continue to have FLPP in the future. BMI increased with time over the course of the study; however, the rate of increase in BMI was not different between women with FLPP at baseline and women who did not report FLPP at baseline.

We found that Black women and women of lower education attainment were more likely to report FLPP at baseline, which supports the literature indicating that individuals of low socioeconomic status and Blacks are disproportionately affected by the legal system (8). Surprisingly, we found no differences in the association between FLPP and BMI by race or education despite the assumption that Blacks and women of low socio-economic status may experience these problems more frequently or from a greater number of network sources. These findings provide an insight into

the personal impact of having a family member with legal/police problems. Although Whites and those of higher socioeconomic status may experience less incidence of family members with legal/police problems, these women appear to experience the same personal health effects as women who may experience higher incidence of FLPP.

Few studies have investigated the physical health of adult family members of persons facing legal issues. In fact, to our knowledge, studies that investigate family health are limited to the families of incarcerated persons (23, 24, 30). Specifically, these studies focus primarily on children of incarcerated persons and risk of sexually transmitted disease among partners of inmates or returned citizens. Most of these studies employ qualitative methods and do not use epidemiologic tools to identify health disparities and/or risks. The results of this study are consistent with previous findings from studies of family member incarceration. A National Survey of American Life study by Lee and colleagues among 5,470 adults aged 18 and older found that having a family member incarcerated increased the likelihood of poor health across five conditions including obesity (OR: 1.44, 95% CI: 1.80 – 3.55) among women (24). This study also found no differences in the association between having a family member with legal/police problems and health disparities by race; however, Whites in this study were sampled from neighborhoods in which Blacks made up at least 10% of the community. Our findings are less consistent with studies specifically investigating the health of female partners of returned citizens. Wildeman and colleagues conducted a cross-sectional survey study of 332 recently released men and their female partners. The researchers report that female partners

engaged in risky health behaviors including substance abuse and had high prevalence of asthma, hypertension, anxiety, and depression. The study did not find high prevalence of obesity among female partners; however, the data was self-reported, overweight was not assessed, and women were of younger age (30). These studies, coupled with our current analysis, support the consideration of family members of individuals facing legal or police problems as a vulnerable population that may benefit from increased study and subsequent health interventions (24). The current literature would benefit from more studies that broaden the scope of legal problems beyond incarceration to include legal encounters such as parole, community policing, and misrepresentation.

The mechanism by which this social exposure "gets under the skin" may be explained by the concept of network stress. Stressors have been implicated as major psychosocial risk factors in the development of illness and disease (31, 32). Not only do these stressors originate from one's own circumstances, but the circumstances of others whom we care about (20). Stress exerts changes upon the body through a variety of pathways. One such route is through the release of corticosteroids (cortisol) (33). Under conditions of chronic stress, the body will activate a "passive" response through the hypothalamic-pituitary-adrenal (HPA) axis. This response can, in turn, induce physiological changes like blood pressure elevation and decreasing blood flow to components of the digestive system (34). Corticosteroids have a major stimulating effect on energy consumption, and in the presence of insulin, corticosteroids have been linked to food preference (35).

Additional studies have also linked stress-induced cortisol to reduced dietary restraint and consumption of foods dense in sugars, carbohydrates and/or fats (36-40). A study by Wardle and colleagues found that stress was associated with increased energy intake, specifically from foods high in saturated fatty acids and non-milk extrinsic sugars (NMES) (39). For instance, times of high work demand were associated with increased consumption of foods such as cake, chocolate, and savory snacks. These works have contributed to a growing literature on the "comfort food hypothesis" (38). A 2007 study by Roberts produced similar findings in a group of 71 healthy women; researchers found that the association between salivary cortisol and BMI was mediated by dietary restraint (37). A sub-analyses of these women further demonstrated that increases in cortisol secretion predicted increased consumption of calories from fat and carbohydrates, but not protein. In turn, increased consumption of calories from fat and carbohydrates, but not protein, predicted increases in BMI (38). Surprisingly, Roberts and colleagues also report that women with higher BMIs and marked increase in cortisol secretion during periods of chronic stress were more vulnerable to increases in bodyweight than women with lower BMIs and less cortisol secretion (36). This finding may help to explain the stability in increased BMI overtime among women who report FLPP at baseline compared with women who did not report FLPP at baseline, despite the fact that women with no FLPP at baseline could have reported FLPP later in follow-up.

One limitation of this study is the assessment of having a family member with legal/police problems at baseline. The realm of having legal problems could potentially span from getting a parking ticket, to being on parole, to awaiting

execution on death row. Also the duration of FLPP was not assessed. Another limitation of this study is the comparison group. Because we are comparing women with FLPP to those without FLPP at baseline, some of the women who did not report having FLPP at baseline experienced this stressor later in follow-up. We performed sensitivity analyses to assess the extent of this potential bias. In our comparisons of women who reported FLPP at baseline with women who did not report any FLPP throughout follow-up, we found that the BMI difference between these women was even greater.

Despite the limitations of this study, these findings add valuable insight to the very limited literature on the physical health of the family members of those experiencing legal difficulty. To our knowledge, this study is the first to assess the physical health of a multi-ethnic sample of mid-life, female family members of those with legal/police problems. Previous studies have broadly covered adults of all ages or been limited to partners and children of incarcerated individuals. This study likely captures the network stress taken on by not only partners but also mothers, aunts, and sisters. Notably, the longitudinal design of this study also allows for the assessment of trends and rate differences in race and socioeconomic subgroups.

This study demonstrates that legal/police problems extend well beyond the alleged offender and affects the well-being of family members – specifically women. Family members of persons experiencing legal or police problems should be considered a vulnerable population. Despite their legal innocence and independence from blame, family members may be directly affected by the problems experienced by accused relatives. Future studies should seek to better understand and characterize

health disparities in this population and identify ways in which communities and health care professionals can better serve their unique health needs.

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Tables

Table 1. Baseline Demographic, Health, and Behavioral Variables by Report of Family Legal/Police Problems at Baseline, N = 3,302

		Family Legal/Police Problems (FLPP)												
		All				No				Yes				*P*[a]
Variables	**Total N**	**N**	**%**	**Mean**	**SD**	**N**	**%**	**Mean**	**SD**	**N**	**%**	**Mean**	**SD**	
DEMOGRAPHIC														
Age (years)	3,302	3,302		45.9	2.62	2,777		45.9	2.64	506		46.0	2.49	0.38
Race	3,302													<.001
White		1,656	50.2			1,396	50.3			251	49.6			
Black		940	28.5			737	26.5			193	38.1			
Chinese		307	9.3			278	10.0			29	5.7			
Japanese		399	12.1			366	13.2			33	6.5			
Education	3,292													<.001
College degree or higher		1,422	43.2			1,281	46.3			131	25.9			
Some college/technical school		1,201	36.5			976	35.3			225	44.5			
High school or less		669	20.3			510	18.4			150	29.6			
BEHAVIORAL														
Current Smoker	3,256	531	16.3			406	14.9			115	22.7			<.001
Physical activity scale (2 -10)	2,622	2,622		5.9	1.38	2,195		6.0	1.37	417		5.8	1.45	0.06
Daily caloric intake (kcal)	3,119	3,119		1805.2	686.81	2,625		1772.8	664.09	484		1983.8	781.73	<.001
HEALTH														
Body Mass Index (BMI) (kg/m^2)	3,256			27.5	6.69	2,732		27.1	6.40	505		29.4	7.56	<.0001
Menopause status	3,216													0.00
Pre-menopause		1,742	54.2			1,413	52.5			310	61.3			
Early perimenopause		1,474	45.8			1,278	47.5			196	38.7			
Diabetes	3,247	92	2.8			60	2.2			23	4.6			0.00
Depression	3,302	630	19.1			462	16.6			159	31.4			<.0001

Abbreviations: SD, standard deviation

[a] P values represent comparisons between women reporting FLPP at baseline with women who did not report FLPP at baseline and are from X^2 and *t* tests at $\alpha = 0.05$.

Table 2. Results From Generalized Linear Mixed Models Predicting Body Mass Index (kg/m^2)

		Model 1[a]				Model 2[b]				Model 3[c]				Model 4[d]			
Variable (reference group)	**Values**	**B**	**LL**	**UL**	***p***	**β**	**LL**	**UL**	***p***	**β**	**LL**	**UL**	***p***	**β**	**LL**	**UL**	***p***
FLPP (No)	Yes	1.20	0.49	1.90	**<.001**	1.09	0.37	1.81	**<.01**	0.96	0.15	1.78	**0.02**	0.96	0.14	1.77	**0.02**
Visit	Years					0.14	0.13	0.15	<.001	0.13	0.10	0.16	<.001	0.13	0.10	0.16	<.001
Age	Years	0.08	-0.01	0.17	0.10	0.07	-0.02	0.16	0.10	0.06	-0.04	0.16	0.26	0.06	-0.04	0.16	0.26
Race (White)	Black	3.58	2.97	4.20	<.001	3.57	2.95	4.18	<.001	3.74	3.06	4.43	<.001	3.74	3.05	4.43	<.001
	Chinese	-4.79	-5.42	-4.17		-4.87	-5.50	-4.25		-4.76	-5.46	-4.06		-4.76	-5.47	-4.06	
	Japanese	-5.11	-5.69	-4.53		-5.18	-5.76	-4.60		-4.74	-5.38	-4.11		-4.75	-5.39	-4.11	
Education (College degree or higher)	Some college	1.22	0.67	1.77	<.001	1.25	0.69	1.80	<.001	1.25	0.65	1.85	<.001	1.26	0.66	1.86	<.001
	High school or less	1.45	0.79	2.10		1.50	0.84	2.15		1.45	0.67	2.23		1.45	0.67	2.23	
Current Smoker (No)	Yes									-0.68	-1.04	-0.31	<0.001	-0.69	-1.07	-0.32	<.001
Total Caloric Intake	kcal									0.00	0.00	0.00	<.001	0.00	0.00	0.00	<.001
Physical activity Scale	2 to 10									-0.24	-0.30	-0.18	<.001	-0.24	-0.30	-0.18	<.001
Menopause status (Pre menopause)	Early PM									0.24	0.09	0.40	0.01	0.24	0.08	0.40	0.01
	Late PM									0.25	0.04	0.46		0.24	0.04	0.45	
	Post menopause									0.24	0.01	0.47		0.24	0.01	0.47	
	Other[a]									0.36	0.16	0.55		0.35	0.16	0.55	
Diabetes (No)	Yes									-0.59	-0.94	-0.23	<.01	-0.56	-0.92	-0.20	0.01
Depressed (No)	Yes													0.02	-0.08	0.13	0.66
FLPP*Visit	Yes*(0-10)					0.03	-0.01	0.06	0.19	0.03	-0.03	0.09	0.33	0.03	-0.03	0.09	0.32

Abbreviations: FLPP, family legal/police problems; LL, lower limit; PM, peri-menopause; UL, upper limit

[a] N = 2,983

[b] N = 2,983

[c] N = 2,277

[d] N = 2,277

[e] Menopause status "Other" includes women described as 1) having a hysterectomy/both ovaries removed, 2) pregnant/breastfeeding, or 3) unknown due to hormone therapy use

Table 3. Sensitivity Analysis: Results From Generalized Linear Mixed Models Predicting Body Mass Index (kg/m^2)

		Model 1[a]				Model 2[b]				Model 3[c]				Model 4[d]			
Variable (reference group)	**Values**	**β**	**LL**	**UL**	***p***	**β**	**LL**	**UL**	***p***	**β**	**LL**	**UL**	***p***	**β**	**LL**	**UL**	***p***
FLPP (No)	Yes	1.73	0.87	2.60	**<.001**	1.64	0.76	2.52	**<.001**	1.37	0.42	2.31	**<.01**	1.35	0.41	2.29	**<.01**
Visit	Years					0.11	0.09	0.14	<.001	0.12	0.08	0.15	<.001	0.12	0.08	0.15	<.001
Age	Years	0.12	-0.03	0.27	0.12	0.12	-0.03	0.27	0.12	0.14	-0.02	0.29	0.09	0.14	-0.02	0.29	0.08
Ethnicity (White)	Black	3.46	2.39	4.53	<.001	3.44	2.37	4.51	<.001	3.58	2.44	4.71	<.001	3.57	2.44	4.71	<.001
	Chinese	-4.49	-5.52	-3.46		-4.52	-5.56	-3.49		-4.39	-5.51	-3.27		-4.39	-5.51	-3.27	
	Japanese	-4.85	-5.73	-3.97		-4.85	-5.73	-3.97		-4.50	-5.42	-3.57		-4.50	-5.42	-3.57	
Education (College degree or higher)	Some college	1.15	0.27	2.02	0.01	1.15	0.27	2.04	0.01	0.96	0.06	1.86	0.01	0.97	0.07	1.87	0.01
	High school or less	1.24	0.17	2.32		1.27	0.20	2.34		1.56	0.36	2.76		1.56	0.36	2.75	
Current Smoker (No)	Yes									-0.82	-1.32	-0.31	<.01	-0.81	-1.32	-0.31	<.01
Total Caloric Intake	kcal									0.00	0.00	0.00	<.01	0.00	0.00	0.00	<.01
Physical activity Scale	2 to 10									-0.22	-0.31	-0.14	<.001	-0.22	-0.31	-0.14	<.001
Menopause status (Pre menopause)	Early PM									0.18	-0.03	0.40	0.05	0.18	-0.03	0.39	0.06
	Late PM									0.05	-0.23	0.33		0.05	-0.23	0.33	
	Post menopause									0.08	-0.24	0.40		0.08	-0.24	0.40	
	Other[a]									0.25	0.02	0.49		0.26	0.02	0.49	
Diabetes (No)	Yes									-0.90	-1.51	-0.30	<.01	-0.88	-1.50	-0.26	0.01
Depressed (No)	Yes													0.11	-0.02	0.25	0.10
FLPP*Visit	Yes*(0-10)					0.05	0.01	0.09	**0.02**	0.06	0.00	0.12	**0.05**	0.06	0.00	0.12	**0.05**

Abbreviations: FLPP, family legal/police problems; LL, lower limit; PM, peri-menopause; UL, upper limit

[a] N = 1,145

[b] N = 1,145

[c] N = 970

[d] N = 970

[e] Menopause status "Other" includes women described as 1) having a hysterectomy/both ovaries removed, 2) pregnant/breastfeeding, or 3) unknown due to hormone therapy use