

African-American Womens' Eating Habits and Intention to Change: a Pilot Study

Fern J. Webb · Jagdish Khubchandani · Michelle Doldren ·
Joyce Balls-Berry · Shirley Blanchard · Liane Hannah ·
Jevetta Stanford · Selena Webster-Bass

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Abstract Unhealthy diet is one of the leading contributors for chronic disease related morbidity and mortality in African-American (AA) women living in the USA. The purpose of this study was to describe eating habits and intention to change using the stages of change (SOC) model in a sample of AA women. A cross-sectional population-based study was conducted in Florida with AA women. A total of 292 AA women participated. Outcome variables were eating breakfast, foods having low to no fat, fruits and vegetables, whole grain products, foods with low to no salt, and few to no snacks. SOC was the main independent variable. Almost half (48 %) seldom added salt to meals, 45 % consumed low-fat foods,

32 % consumed breakfast every day, and 32 % consumed primarily whole grain products. Women in action and maintenance SOC were significantly more likely to eat breakfast (odds ratio (OR)=1.50, 95 % confidence interval (CI): 1.10–2.03), mostly or only low-fat foods (OR=4.11, 95 % CI: 2.59–6.51), ≥ 4 servings of fruits and vegetables (OR=1.75, 95 % CI: 1.09–2.83), and whole grain products (OR=2.05, 95 % CI: 1.42–2.97). AA women want to eat healthier but do not always practice healthy diets. Understanding SOC can be essential to develop interventions for improving AA women's eating habits.

Keywords Diet · African-American · Women · Stages of change · Health behavior

F. J. Webb · L. Hannah
Department of Community Health and Family Medicine,
University of Florida, Jacksonville, FL 32208, USA

J. Khubchandani (✉)
Department of Physiology and Health Science, Ball State University,
Muncie, IN 47306, USA
e-mail: jkhubchandani@bsu.edu

M. Doldren
Institute for Child Health Policy, Nova Southeastern University,
Fort Lauderdale, FL 33328, USA

J. Balls-Berry
Section of Clinical Epidemiology, Mayo Clinic, Rochester,
MN 55905, USA

S. Blanchard
School of Pharmacy and Health Professions, Creighton University,
Omaha, NE 68178, USA

J. Stanford
Clinical and Translational Science Institute, University of Florida,
Jacksonville, FL 32208, USA

S. Webster-Bass
Webster-Bass Health Resources, Jacksonville, FL 32208, USA

Introduction

It is well documented that an unhealthy diet is a significant contributor to the leading causes of death in the USA. Eating habits are a function of age, gender, race/ethnicity, culture, socioeconomic status, and food availability [1–3]. Unhealthy dietary patterns and the associated burden of chronic diseases, morbidity, and mortality are more frequent in those who are disadvantaged based on a variety of factors like income, education, race, and ethnicity [1–6]. For example, African-American (AA) women in the USA earn significantly less than men and women of other races and ethnicities, even when they have similar qualifications and occupational statuses. This disparity in income of AA women inherently influences food choices and increases the subsequent risk of chronic disease morbidity and mortality. In addition, eating habits of AA women in the USA are significantly influenced by cultural celebrations and rituals that often include eating foods prepared by frying, seasoning with animal fat, or adding refined sugar [2, 3, 6–8].

Stages of change (SOC), a construct of the transtheoretical model (TTM), was developed using psychotherapy and behavioral change theories to characterize one's readiness to change a particular behavior (e.g., diet) [9, 10]. SOC represents a temporal dimension of change that occurs over time and consists of (1) *precontemplation stage* where one is not considering a behavior change, (2) *contemplation stage* where one is aware that a behavior change needs to occur, (3) *preparation stage* where one begins to make specific plans to change behavior, (4) *action stage* where one is actually beginning to practice the new behavior for no more than 6 months, and (5) *maintenance stage* where one has changed and is practicing the new behavior for at least 6 months. The TTM postulates that in order to practice a healthy behavior and to acquire a new lifestyle, individuals will pass through these stages and gradually acquire a new health behavior and this movement from one stage to another can be manipulated by using specific processes of change [10–12].

Empirical research suggests that the SOC model can be used to explain fat intake among AA women who have been assessed for their intentions to eat healthy. For example, Hargreaves and colleagues found that AA women who reported being in the action stage reported less fat intake compared to women who were in the precontemplation or contemplation stages [13]. Moreover, a study of rural AA women in the USA found that education, friends' thoughts on weight, body mass index (BMI), and positive attitudes about weight loss were significant predictors of SOC as it relates to practicing a healthy diet [14]. Sbrocco and colleagues examined SOC and behavioral outcomes among AA women entering obesity treatment programs. Sbrocco found that SOC may be a useful construct for understanding behavioral change among AA women pursuing weight management and that SOC for eating habits among African-Americans should be further investigated [15]. Examining SOC is complex in its relation to dietary change and eating habits for individuals. For example, a single person can be found currently maintaining a particular eating habit (i.e., eating at ≥ 3 fruits and vegetables per day), but contemplating a change of another eating habit or behavior (i.e., eating more whole grain products). This is consistent with several published studies confirming that people are at different stages for individual fat-reducing behaviors [8, 16, 17].

A 2010 American Heart Association scientific statement suggested that more evidence regarding the usefulness of the SOC construct, aimed at intervening with dietary changes for African-Americans, is needed [18]. Moreover, little is known about eating habits among African-American women and the association of their eating habits with intentions to change. Thus, the purpose of this study was to examine the association between SOC and eating habits in a sample of African-American women.

Methods

Participants and Study Design

This cross-sectional population-based study was approved by the University of Florida Institutional Review Board-03. African-American research assistants recruited women living in four urban environments throughout Florida, to ensure recruitment of socially and culturally diverse groups with varied health experiences, lifestyles, and socioeconomic statuses. To recruit participants, information about the study was distributed at churches, day cares, grocery stores, hair salons, and sorority meetings in four major towns of Florida (i.e., Fort Lauderdale, Jacksonville, Miami, and Tampa, and at the four collaborating universities). Information about the study was also posted on community and university websites and shared throughout the authors' professional, social, and personal networks. An a priori power analysis for external validity of the results was conducted. Based on an eligible population of approximately 1.4 million adult African-American women in Florida, and a 75/25 split with regard to the practice of interest (i.e., assuming that less than a fourth of all the participants would be engaging in healthy eating), it was determined that a sample of 289 adult African-American women would be needed to make inferences to the total population with a sampling error of $\pm 5\%$ at the 95% confidence level. A total of 350 AA women agreed to participate in the study and 292 women met inclusion criteria (others excluded based on race, age, and geographic location).

Instrument, Variables, and Measures

A questionnaire with face validity was developed for this study based on a comprehensive review of the literature on African-American women's eating habits and stages of change. Also, the questionnaire was developed using items from the Behavioral Risk Factor Surveillance System (BRFSS) survey, a national household assessment of peoples' lifestyle and behavior [19]. African-American women ($n=15$) ages 18 to 60 years and experts ($n=3$) in survey research and public health reviewed the questionnaire to ensure content validity. As a result of reviewers' feedback, questions were reworded, condensed, or deleted. The final questionnaire consisted of 90 items assessing health behaviors, health status, overall health views, stages of change for health behaviors, and sociodemographic factors. For the purpose of this study, eating habits, stages of change to practice good eating habits, personal health history, body mass index (BMI) calculated from height and weight, and sociodemographic factors are analyzed.

Items focusing on eating habits were worded to reflect dietary recommendations of the US Department of Health and Human Services (US DHHS) and the Department of

Agriculture [19, 20]. Healthy eating habits were defined as eating *breakfast* every day, eating mostly or only low-fat foods, eating at least four servings of *fruits and vegetables* daily, eating primarily or only whole *grain* products, seldom or never adding *salt* to food, and seldom or never eating unhealthy *snacks*. Examples of unhealthy snacks were chips, pastries, soft drinks, candy, ice cream, and cookies.

Readiness to change eating habits was measured by the statement “Indicate how ready you are to make the changes or improvements in your health in the following areas: practice good eating habits.” Responses were “haven’t thought about changing (precontemplation),” “plan a change in the next 6 months (contemplation),” “plan to change this month (preparation),” “recently started doing this (action),” and “do this [practice] regularly [last 6 months] (maintenance).” The SOC questions were modeled from Prochaska and Velicer’s TTM and Sutton’s single-item measure guidelines to increase validity [13, 21].

Data Analysis

Data were analyzed using SAS version 9.13 (SAS, Inc., Cary, NC, 2012). Sociodemographic characteristics, readiness to change eating habits, and current eating habits were descriptively analyzed. Data were tested for normality and analyzed using nonparametric tests of chi-square statistics and logistic regression. Logistic regression was used to analyze associations between each eating habits (dependent variable) and SOC (independent variable), controlling for sociodemographic characteristics and health status. Significance levels were assumed a priori at $p < .05$ for all analyses.

Each eating habit was separately modeled as the dependent variable and dichotomized as “yes”/“no”: breakfast—“eating breakfast every day”; fats—“eating mostly or only low-fat foods”; fruits and vegetables—“eating four or more servings of fruits and vegetables each day”; grains—“eating primarily or only whole grain products”; salt—“seldom or never adding salt to food or seldom eating salty foods”; and snacks—“seldom or never eating typical snacks.” All items on eating habits ($n=6$ items) were treated like a scale, and to estimate the reliability of the scale, Cronbach alpha coefficient was computed and found to be reasonable ($\alpha=0.72$).

SOC was dichotomized into precontemplation, contemplation and preparation as the referent group, and action and maintenance as the comparison group. Age, BMI, and income were included as continuous variables while education, marital status, and location of residence were included as categorical variables. Education was dichotomized into “some college” versus “less than college.” Marital status was dichotomized as “married” versus “others.” Location was dummy-coded to represent each site/location. Location was defined as the place where the respondent was from or closest to (i.e., Fort Lauderdale/Miami, Jacksonville, and Tampa).

Results

Participant Characteristics

The final sample of 292 women (out of 350 women recruited) met the inclusion criteria (others excluded based on race, age, and geographic location), ensuring enough power and sample size for the study. Mean age of participants was 36.4 years (range 18–73 years). Approximately 46 % of participants were single, 40 % were married, and 12 % were divorced. The majority of participants reported having household incomes of at least US\$30,000 (58 %) and reported currently working for pay (90 %). The median household income for our study participants was \$30,000–49,999 (highly representative of AA population in Florida and USA; median household income for AA individuals in Florida is \$34,690 and overall in the USA is \$35,564). Almost one third graduated from high school (32 %) or college (33 %) and almost one fifth had a graduate degree (21 %) (Table 1).

The majority (60 %) of participants were overweight with personal health complaints of high blood pressure (24 %) and high cholesterol (13 %). The majority of women also reported a family history of physiological health problems such as high blood pressure (82 %) and diabetes (64 %). The national data from US DHHS show that among AA women ages ≥ 18 years, 30 % are overweight, 44.3 % have high blood pressure, and 25.6 % have high cholesterol [22–24].

Self-Reported Eating Habits of African-American Women

Nearly one third of women consistently ate breakfast (32 %). However, only 4 % consumed foods low in fat; 8 % of women consumed ≥ 5 servings of fruits and vegetables daily (for all AA adults in Florida, this proportion is 24.5 %). The majority (69 %) consumed ≤ 2 servings of fruits and vegetables daily. Few (5 %) women reported eating only whole grain products, while a little more than one in ten (12 %) reported always eating refined grain products. Almost half of all AA women (48 %) seldom or never added salt to food while a little more than one in five (22 %) seldom or never ate typical snacks (Table 2).

Relationship Between Stages of Change and Eating Habits

Regarding SOC, 5 % of women were in the precontemplation stage, 14 % were in the contemplation stage, 15 % were in the preparation stage, 34 % were in the action stage, and 32 % were in the maintenance stage.

There was a statistically significant association between self-reported SOC and each eating habit except for eating breakfast (chi-square $[\chi^2]=8.52$, $p=.07$) and eating salty foods ($\chi^2=5.32$, $p=.25$) (Table 3). In essence, women reporting advanced SOC were statistically significantly more

Table 1 Selected sociodemographic characteristics of participants ($n=292$)

	N^a	Percentage ^b
<i>Education</i>		
None	2	< 1
GED/HS diploma	91	32
Some college/professional certificate	11	4
Associate's degree	29	10
Bachelor's degree	95	33
Master's degree	49	17
Doctorate degree	11	4
<i>Marital status</i>		
Married	114	40
Other (including single, divorced, widowed, and separated)	173	60
<i>Location</i>		
Fort Lauderdale	40	14
Jacksonville	38	13
Miami	38	13
Tampa	124	43
Other areas	49	17
	Median	Range
Age (years)	35	18–73
Household income	\$30,000–\$49,999	<\$10,000–≥130,000

^a Individual categories may not sum to 292 due to missing values

^b Percentage may sum to >100 due to rounding

likely to report eating mostly or only low-fat foods, ≥ 4 daily servings of fruits and vegetables, primarily or only whole grain products, and few to no typical snacks (Table 3).

To better estimate the relationship between self-reported SOC and eating habits, a logistic regression analysis was conducted to generate adjusted odds ratios (AORs) after controlling for sociodemographic characteristics of participants (Table 4). Each eating habit was modeled as a dichotomous dependent variable (yes or no) with SOC modeled as a dichotomous independent variable (maintenance/action vs. precontemplation/contemplation/preparation). Women in the maintenance and action stage of change were significantly more likely to eat breakfast (AOR=1.50, 95 % confidence interval (CI): 1.10–2.03), mostly or only low-fat foods (AOR=4.11, 95 % CI: 2.59–6.51), ≥ 4 daily servings of fruits and vegetables (AOR=1.75, 95 % CI: 1.09–2.83), and whole grain products (AOR=2.05, 95 % CI: 1.42–2.97). Age and income were significant predictors of eating habits when included as covariates in estimating the association between self-reported SOC and eating habits (Table 4).

Discussion

Our study found that African-American women struggle with certain healthy eating behaviors. Women in this study did not adequately follow the recommended eating guidelines as

outlined by the US DHHS [25]. Our findings are consistent with an earlier review reporting that African-Americans are less likely to consume recommended daily servings of fruits and vegetables. Also, the majority of participants in our study did not consume ≥ 5 servings of fruits and vegetables on a daily basis, which is comparable to a statewide study of AA women in Florida where we conducted our study [26, 27]. Conversely, AA women in our study reported eating breakfast regularly, which is essential since eating breakfast has been shown to have numerous benefits [28]. However, the number of AA women who reported eating or adding salt to foods is alarming. A significant amount of sodium is already present in processed foods that are popular choices of AA women. Adding more salt poses exponential risks [29, 30]. Although this study did not quantify sodium intake, sodium is directly linked to hypertension which is prevalent in AA women [31]. There are several guidelines and recommendations from state and national health agencies about reducing sodium in foods (e.g., US Centers for Disease Control and Prevention) [32]. However, it appears from our study that AA women are not following recommendations. Clinicians and public health practitioners should further advocate for and educate high-risk populations (e.g., African-American women) about the existing recommendations and guidelines for reduced daily sodium consumption and harms of extra sodium in food.

We also examined the relationship between SOC and eating habits. Our findings indicate that regardless of geographic boundaries or sociodemographic characteristics, AA women

Table 2 Self-reported eating habits of participants

Eating habit	N ^a	Percentage ^b
<i>Breakfast</i>		
Eat breakfast everyday	92	32
Eat breakfast most mornings	63	22
Eat breakfast two to three times per week	51	18
Seldom or never eat breakfast	82	28
<i>Fat intake</i>		
Nearly always eat high-fat foods	21	7
Eat mostly the high-fat foods, some low-fat	50	17
Eat both about the same	89	31
Eat mostly low-fat foods, some high-fat	119	41
Eat only low-fat foods	12	4
<i>Fruits and vegetables (servings)</i>		
1 or less	111	39
2 daily	85	30
3 daily	51	18
4 daily	18	6
5 or more	23	8
<i>Grains</i>		
Nearly always eat refined grain products	35	12
Eat mostly refined grain products	57	20
Eat both about the same	105	36
Eat mostly whole grain products	79	27
Eat only whole grain products	14	5
<i>Salt</i>		
Seldom or never	138	48
Some meals	83	29
Most meals	40	14
Nearly every meal	26	9
<i>Snacks</i>		
3 or more times per day	51	18
Once or twice per day	82	28
Few times per week	92	32
Seldom or never eat typical snacks	63	22

^a May not sum to 292 due to missing values

^b Percentage may total to >100 due to rounding

seem somewhat motivated to change eating habits. However, there could be factors (such as income) that preclude healthier dietary habits in AA women. The highest proportions of women practicing healthy eating habits are reported being in the maintenance SOC. Possibly, these women face fewer barriers to eating healthy and may have higher knowledge levels about healthy eating.

Interestingly, we observed inconsistencies across SOC categories (see Table 3). For example, the percent of women eating breakfast was higher among women classified as contemplators and preparers compared to women in the action SOC. This cognitive dissonance can be interpreted as some

women in the action SOC may think that they are eating healthy, but in fact, they are not. It could also be interpreted that women in the action SOC are unaware of recommended eating habits although knowledge of current eating recommendations was not measured in the current study. Similar studies suggest that knowledge is important. A qualitative study of African-Americans living in the state of North Carolina revealed low awareness of daily recommendations for fruits and vegetables [33]. Moreover, a recent Academy of Nutrition and Dietetics report confirmed that while the majority of individuals were aware of what they should not eat, few were aware of what they should eat [34]. Our findings are consistent and indicate that regardless of SOC, AA women were more likely to add salt to food and less likely to eat fruits, vegetables, and whole grains.

As mentioned earlier, examining SOC is complex in its relation to dietary change and eating habits for individuals. For example, a single person can be found currently maintaining a particular eating habit (i.e., eating the recommended amount of fruits and vegetables per day), but contemplating a change in another eating habit or behavior (i.e., reducing salt consumption or unhealthy snack consumption). As these behaviors will intersect in different ways within different individuals in any sample, focusing on a single behavior as an outcome for intervention planning may have limited value. Future research in this area is warranted and practitioners should consider such inconsistencies within a population across various eating behaviors.

Our study findings should be considered in the light of several limitations. The temporal relationship between SOC and actual eating habits is unclear. For example, do women's SOC precede current eating habits, or do current eating habits predict SOC? This question requires additional research using prospective or intervention study designs. Another limitation is that participants in this study may be more aware and eager to change health behaviors given their willingness to take the time to complete the 15-min survey; thus, this sample may not be representative of AA women throughout the USA; this was a convenience sample. However, our findings are consistent with those of other researchers. Self-reported data also have several inherent biases. Participants tend to underreport dietary intake, weight, and height or provide socially desirable responses, often resulting in potential overestimation of healthy eating practices [35, 36]. Finally, this was a cross-sectional observational study and the findings could suffer from the inherent flaws of cross-sectional study designs.

This study adds value to the current knowledge about SOC and current eating habits of AA women. The strength of the study is the unique inclusion of educated, married, and a reasonable number of middle-class African-American women, a group traditionally understudied. Also, the reason for measuring SOC is that it theoretically represents an underlying psychological process of actual change; each stage is a

Table 3 Association of self-reported eating habit with stage of change (bivariate analysis)

Eating habit	Precontemplation	Contemplation	Preparation	Action	Maintenance	χ^2 / p value
Breakfast ^a						
Yes (%)	21	28	29	24	43	8.52 0.07
Low fat ^b						
Yes (%)	14	13	17	41	79	25.2 <0.001*
Fruits/vegetables ^c						
Yes (%)	7	6	2	12	26	18.4 <0.001*
Grains ^d						
Yes (%)	7	18	19	40	53	28.5 <0.001*
Reduced salt ^e						
Yes (%)	43	44	38	49	57	5.32 0.25
Snacks ^f						
Yes (%)	5	11	21	31	43	18.1 <0.001*

**p* value statistical significance assumed a priori at *p*<0.05

^a Eat breakfast everyday

^b Eat mostly or only low-fat foods

^c Eat four or more daily servings of fruits and vegetables

^d Eat primarily or only whole grain products

^e Seldom or never add salt to food

^f Seldom or never eat typical snacks

χ^2 chi-square test statistical value

Table 4 Logistic regression analysis to estimate association between self-reported stages of change and eating habits

	Breakfast ^a	Fat ^b	Fruits and vegetables ^c	Grains ^d	Salt ^e	Snacks ^f
	AOR (95 % CI)	AOR (95 % CI)	AOR (95 % CI)	AOR (95 % CI)	AOR (95 % CI)	AOR (95 % CI)
<i>Stages of Change</i>						
Maintenance/action vs. Precontemplation/contemplation/preparation	1.50 (1.10–2.03)	4.12 (2.59–6.51)	1.75 (1.09–2.32)	2.05 (1.42–2.97)	1.26 (.96–1.64)	1.29 (.92–1.83)
	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
Age	1.00 (.97–1.04)	1.01 (.97–1.05)	1.01 (.97–1.06)	1.05 (1.01–1.089)	1.04 (1.01–1.07)	1.02 (.98–1.06)
Body mass index	1.01 (.96–1.06)	.96 (.91–1.02)	.99 (.93–1.07)	1.02 (.97–1.07)	.97 (.93–1.02)	.98 (.93–1.04)
Education	1.34 (.65–2.74)	.97 (.43–2.21)	1.59 (.57–4.42)	1.34 (.61–2.93)	.73 (.37–1.44)	.65 (.29–1.49)
Family health	1.10 (.87–1.39)	1.06 (.81–1.38)	.91 (.66–1.26)	.94 (.72–1.22)	1.08 (.86–1.34)	1.11 (.85–1.46)
Income	1.01 (.81–1.27)	1.31 (1.00–1.71)	1.37 (1.03–1.84)	.98 (.76–1.26)	1.17 (.94–1.46)	1.08 (.83–1.40)
Location	1.01 (.78–1.32)	1.13 (.83–1.53)	.81 (.57–1.13)	1.16 (.86–1.57)	1.01 (.79–1.31)	1.01 (.74–1.37)
Marital status	.76 (.36–1.59)	.57 (.25–1.32)	.53 (.19–1.48)	.63 (.28–1.40)	.58 (.29–1.18)	1.24 (.54–2.84)
Personal health	1.21 (.95–1.56)	.97 (.68–1.38)	.97 (.62–1.54)	1.07 (.81–1.42)	.85 (.63–1.15)	1.03 (.76–1.39)

This table reports association of perceived stage of change with eating habits/dietary practice. Variables: eating habits modeled as dichotomous outcome variables (Yes vs. No) and stage of change (maintenance/action vs. precontemplation/contemplation/preparation) modeled as dichotomous predictor variables

Outcomes:

^a Eat breakfast everyday

^b Eat mostly or only low-fat foods

^c Eat four or more daily servings of fruits and vegetables

^d Eat primarily or only whole grain products

^e Seldom or never add salt to food

^f Seldom or never eat typical snacks

AOR adjusted odds ratios (simultaneously controlling for other variables), CI 6ltervals, Ref reference group

manifestation of a deeper thought process that has already taken place about one's need to eat healthier. It is always difficult to study psychological changes although SOC has been shown to be a suitable manifestation measure of psychological processes. Similar to age-appropriate messages, SOC appropriate messages may serve to better motivate African-American women to improve eating practices. In addition, more research is needed to understand whether AA women lack knowledge of these recommendations, or if they are aware of them but lack knowledge on how to apply these recommendations to their everyday eating practices. Follow-up studies could include a larger sample size, in-depth assessment of knowledge about healthy dietary practices, more detailed inquiry about dietary practice, and longitudinal exploration of social, cultural, and interpersonal influences on dietary practice.

Conclusions

In conclusion, we found in our study that AA women do not adequately follow the recommended eating guidelines for a healthy diet (e.g., consuming ≥ 5 servings of fruits and vegetables on a daily basis). In addition, more than one in five women add salt to most or all of their meals. Finally, we found, based on SOC model, an association between current dietary practice and intention to change. African-American women want to eat healthy and are eager to implement practices that are effective and sustainable.

A first step is to correctly identify women in different stages of change and to plan strategies to move AA women from the precontemplation, contemplation, and preparation SOC to action and maintenance SOC. Moving AA women from one stage to another would require designing stage-specific strategies. SOC explains specific processes required to move individuals across stages. Those could very well apply to AA women such as those in our study population. Processes such as consciousness raising could be pertinent in educating and making AA women think about a healthy diet if they have not been thinking about the same (precontemplators). Similarly, for women who are thinking about eating healthy or planning to eat healthy, the interventions could focus on improving self-efficacy, increasing motivation, decreasing barriers, and increasing perceived benefits to eating healthy. These interventions could be implemented at multiple levels (interpersonal, social, organizational, or community based).

Developing clear messages about what is considered "healthy eating" and recommended eating practices, regardless of current SOC, is essential to assist African-American women in improving their current eating habits. Nutritionists and health intervention experts should consider providing tailored interventions, accounting for one's SOC, to improve

African-American women's eating habits. As African-American women learn practical ways to eat healthy, they can become empowered to change.

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Conflict of interest Authors Webb, Khubchandani, Doldren, Balls-Berry, Blanchard, Hannah, Stanford, and Webster-Bass declare that they have no conflict of interest.

Ethics All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all patients for being included in the study.

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