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Weight history, perception of body size, and self-rated physical and mental health in Black female food stamp recipients living in Southeast Louisiana

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Weight history, perception of body size, and self-rated physical and mental health in Black female food stamp recipients living in Southeast Louisiana

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LIST OF ABBREVIATIONS

AIN = American Institute for Nutrition

BMI = Body mass index

BRFSS = Behavior Risk Factor Surveillance System

CCHIP = Community Childhood Hunger Identification Project

CDC = Centers for Disease Control and Prevention

CFSM = Core Food Security Module

CI = confidence interval

CPI = Consumer Price Index

CPS = Current Population Survey

DEXA = dual energy x-ray absorptiometry

EFNEP = Expanded Food and Nutrition Education Program

ERS = Economic Research Service

FIS = food insecure

FISH = food insecure with hunger

FNS = Food and Nutrition Service

FS = food secure

FSP = Food Stamp Program

IBW = ideal body weight

MH = mental health

NCI = National Cancer Institute

NHANES = National Health and Nutrition Examination Survey

NIH = National Institutes of Health

NNMRR = National Nutrition Monitoring and Related Research

PARTS = Physical Appearance Related Teasing Scale

PH = physical health

POTS = Perception of Teasing Scale

PRWORA = Personal Responsibility and Work Opportunity Reconciliation Act

RC = Radimer/Cornell

RDA = Recommended Dietary Allowance

REE = resting energy expenditure

SD = standard deviation

SE = standard error

SES = socioeconomic status

SRDC = Southern Rural Development Center

TANF = Temporary Assistance for Needy Families

TEFAP = The Emergency Food Assistance Program

TFP = Thrifty Food Plan

U.S. = United States

USDA = United States Department of Agriculture

WC = waist circumference

WIC = Women, Infants, and Children

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CHAPTER 1

INTRODUCTION

The United States ranks as one of the wealthiest nations in the world; however, 11.1 percent of its citizens were food insecure, and 3.5 percent experienced food insecurity with hunger during 2002 (8). Compared with the national averages, 13.1 percent and 2.9 percent of Louisiana inhabitants suffered from food insecurity without and with hunger, respectively, in 2002 (8). However, not all groups were equally afflicted at state and national levels. A disproportionate number of female-headed households with children and no spouse experienced food insecurity (8,11,14). Rates of food insecurity complicated by hunger were also higher than the national average among Black and Hispanic households, households below the poverty line, and those in the South and West (8,10-12). Based on the published literature, a Southern female-headed household compounded by minority race and poverty should serve as the prototypical food insecure household.

The identification of these households is imperative in order to prevent severe physical and psychological ailments, which are more prevalent in the food insecure than the general populace. Food insecurity has been associated with higher rates of depression, chronic disease (*e.g.*, type 2 diabetes, hypertension, stroke, cardiovascular disease and certain cancers), and physical limitations in adults; and with depression, poor health, and impaired cognitive and psychosocial development in children (4,12,91,108, 137,175). Moreover, the food insecure are more likely to be overweight or obese when compared to their food secure counterparts (10,171-172,178). This weight discrepancy may arise from limited food access and a subsequent poor food choice. Because grocery

stores frequented by the food insecure have limited refrigeration space and often stock over-ripe or damaged produce, individuals likely buy more shelf-stable, high-energy, non-nutritious foods or patronize fast food restaurants (4,18,22). There is also some evidence that low socioeconomic status (SES) may lead to psychosocial manifestations and stress, which might ultimately produce central obesity through psychoneuroendocrinological pathways (91,234-38).

Obesity concomitant with food insecurity poses additional health concerns. Conditions (*e.g.*, type 2 diabetes, hypertension, stroke, cardiovascular disease and certain cancers) similar to those associated with, and possibly confounded by, food insecurity occur in the overweight and obese (4,13,128,148,153,161,165-166,173,182-188). Hypertension, heart disease and type 2 diabetes are more common among low-income Black females than White males and females (13,47,58,148,154,165). This is not surprising, considering that racial-ethnic minority populations experience a higher prevalence of overweight and obesity than the racial majority (13,47,58,65,128,148-149,153-155,165,191).

Despite the pervasiveness of obesity in racial minorities, low-income Black women are more likely than White women to underestimate their body size; to believe a larger size is more attractive (13,65,221,223); and to report body image discrepancies at higher body mass index (BMI) levels than White females (153,211). Even though there exists a difference between actual and ideal body sizes in heavier Black females, the discrepancies are not as large as those for White women, suggesting that low-income Black females are more satisfied with their bodies (70,153-154,165,211, 215-219). In

fact, Black women may develop a strong self-valuation and an alternative beauty aesthetic to endure societal stigmatization (219).

This opposition to White social norms, compounded by ignorance regarding health and economic consequences of overweight and obesity, presents a dilemma for nutrition educators who attempt to intervene with this population. Because of the high risk for weight-related diseases among Black women, tolerance to and preferences for higher body weights have obvious implications for chronic disease risk (70). Thus, it is imperative that programs be established to facilitate the adoption of healthy diets without threatening the cultural identities of low-income Black females.

Objectives

Objectives of this study were: 1) to categorize the proportion of female food stamp recipients according to food security status (*i.e.*, food secure, food insecure, or food insecure with hunger); 2) to compare actual and perceived weights of women receiving food stamps; and 3) to measure the self-rated physical and psychological health in female food stamp recipients.

Assumptions

Assumptions that were made in the design and implementation of this study were:

1. The sample size ($n=50$) of the participants in this study was adequate to characterize the general behaviors and attitudes of this population cohort.
2. The participants were representative of the desired population (*e.g.*, low income, Black female food stamp recipients, aged 19-75).
3. The United States Department of Agriculture (USDA) Short Form was both a reliable and valid measure of food security.

4. The Perception of Teasing Scale (POTS) was both a reliable and valid measure of weight and competency stigmatization.
5. The Tanita scale was an acceptable, portable substitute for a physician's scale to measure body weight and for underwater weighing or the dual energy x-ray absorptiometry (DEXA) to obtain percent body fat.
6. Potential human error in the assessment of waist circumference (WC) was minimized by taking WC measurements in triplicate.
7. Participants understood all instructions and provided honest responses to questions.

Limitations

Limitations in this study were:

1. A small convenience sample may not produce results that can be generalized to other populations.
2. Interviewers were not indigenous to the majority race (Black), which may have affected participants' responses.
3. There was a reliance on memory to obtain some information; therefore, participant responses may not be accurate.
4. Stunkard's silhouettes did not depict Black females; therefore, participants may not have chosen figures representative of their true size.
5. Stunkard's silhouettes illustrated a limited BMI range of 18.3 to 45.4; therefore, subjects larger than the maximum scale cut-off would, by necessity, underreport their true size.

6. Low educational attainment by the participants may have influenced their comprehension of complex issues (*e.g.*, mental health).

Justification

Food insecurity and food insecurity with hunger plague 11.1 and 3.5 percent¹ of the U.S. population, respectively (8). These conditions are not “equal opportunity” since a greater proportion of impoverished, minority female-headed households suffer from food insecurity with or without hunger (8,11-12,14). Poor mental and physical health may result from food insecurity and thus, may diminish the quality of an individual’s life (4,12,91,108,174-175).

Food insecurity is also associated, paradoxically, with female overweight and obesity (10,83,171-172) and not surprisingly, with the frequency and severity of chronic diseases (4,12,128,187-188). The presence of both overweight or obesity and food insecurity further complicates the health and well-being of the food insecure, especially if a food insecure individual fails to perceive accurately (65,220) or show concern about (70,154,165,215-216,219) her weight. Therefore, it behooves nutrition educators to explore the complex relationship among food insecurity, overweight/obesity, and body image in order to design and effectively implement programs aimed at subduing the problem.

¹ 2002 figures

CHAPTER 2

REVIEW OF THE LITERATURE

Food Insecurity—

Definition and Measurement

Despite the fact that the United States (U.S.) has historically been one of the wealthiest nations in the world and *the* leading consumer of the world's resources, it has not successfully met the dietary needs of its poor. During the Great Depression of the 1930s, concern about the plight of farmers who were losing their farms and the economic problems facing U.S. families, in general, led Congress to enact legislation giving the federal government the authority to buy and distribute excess food commodities (1). The formal identification of poverty and hunger as national burdens led to subsequent policy formulation to prevent these economic predicaments. During this time, however, lobbyists and policy makers integral to food security legislation did not have a specific set of definitions regarding food security and insecurity. To address this need, in 1989, an American Institute for Nutrition (AIN) Expert Panel defined food insecurity as “whenever the availability of nutritionally adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain” and defined hunger as “the uneasy or painful sensation caused by lack of food” (2-4). Food insecurity and hunger were, therefore, not deemed mutually exclusive by the panel; one could experience food insecurity with or without the presence of hunger. Furthermore, hunger was defined on a continuum. The Economic Research Service (ERS) differentiated moderate and severe hunger by the fact that the latter entailed both a reduction in quality and *quantity* of food available for consumption.

The definitions produced by the AIN panel lacked a quantitative means by which those experiencing food insecurity with or without hunger could be identified. Throughout 1994, in response to the National Nutrition Monitoring and Related Research (NNMRR) Act of 1990, federal personnel worked with nutrition researchers and other concerned groups to develop, test and refine a food security questionnaire for inclusion in the U.S. Census Bureau's April 1995 Current Population Survey (CPS) (2,111-112). This questionnaire, adapted from the Radimer/Cornell (RC) measure and Community Childhood Hunger Identification Project (CCHIP), became known as the Core Food Security Module (CFSM) (Appendix A), which identifies households suffering from food insecurity or hunger *at any time* during the previous 12 months (5,113-115). It is calculated from eighteen items based on a set of questions about fifteen experiences and behaviors that are known to typify households having difficulty meeting their food needs (5,116-117,122). For households responding to all 18 items, those affirming less than three items are classified as food secure; those affirming three or more items are food insecure; and those affirming eight or more are food insecure with hunger (Figure 1) (5).

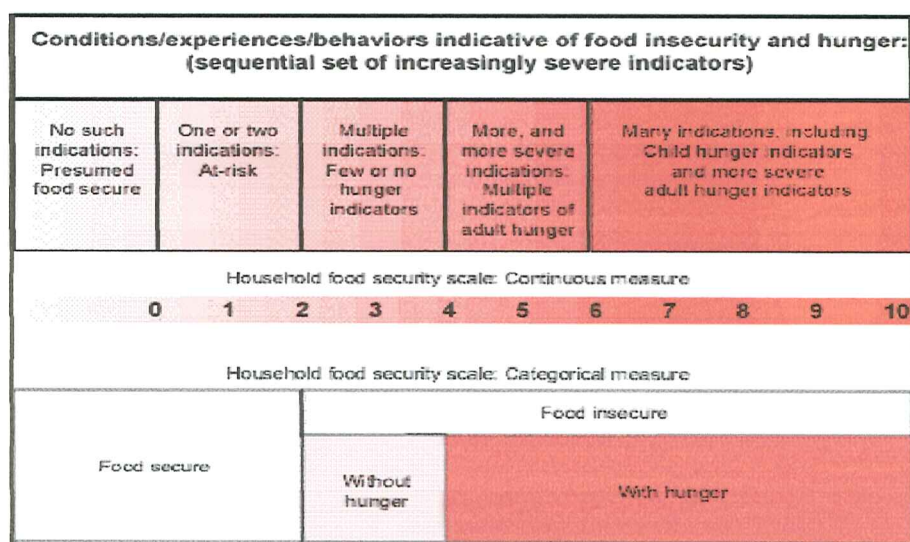


Figure 1. Food security continuum (118)

The particular flaw inherent in the index arises from its rather vague temporal stipulation. Thus, the frequency and duration of food insecure episodes with or without hunger cannot be accurately gauged (5).

A six-item short form Food Security Module (Appendix B) exists for incorporation into surveys with severe time constraints (115). It classifies households as food secure or food insecure with or without hunger and contains no child-specific items (115). In addition to the latter limitation, other disadvantages include the form's inability to measure the most severe levels of hunger, less precision/reliability compared with the 18-item measure, and inappropriateness of use with populations experiencing a high prevalence of physical disabilities or transportation difficulties (*e.g.*, the elderly) (117, 119-21). However, Blumberg et al. (117) found that the short form correctly identified the level of food security for 97.7 percent of all households in their research, including 95.6 percent of all households with children and 99.0 percent of all households without children. Furthermore, the prevalence of both overall food insecurity and food insecurity with hunger were underestimated with the short form by only 0.3 percentage points (117).

Prevalence

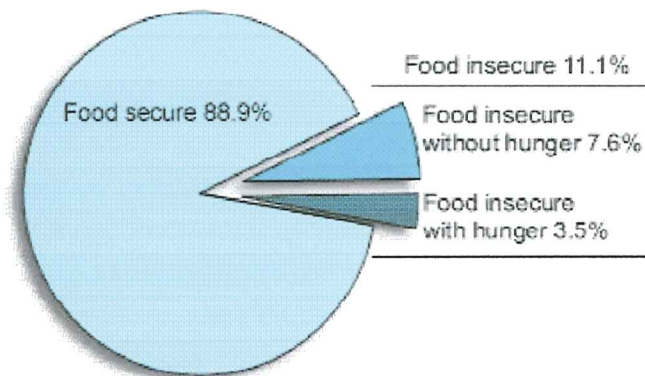
Since food insecurity and poverty maintain an interdependent relationship, an overview of poverty statistics² is necessary in predicting and supporting food insecurity prevalence. Pertinent information extracted from the ERS for both the nation and the State of Louisiana is summarized in Table 1.

² As research was conducted in Louisiana, data comparisons will be made between Louisiana and the national averages.

Table 1. ERS (7) 2000-2001 state statistics

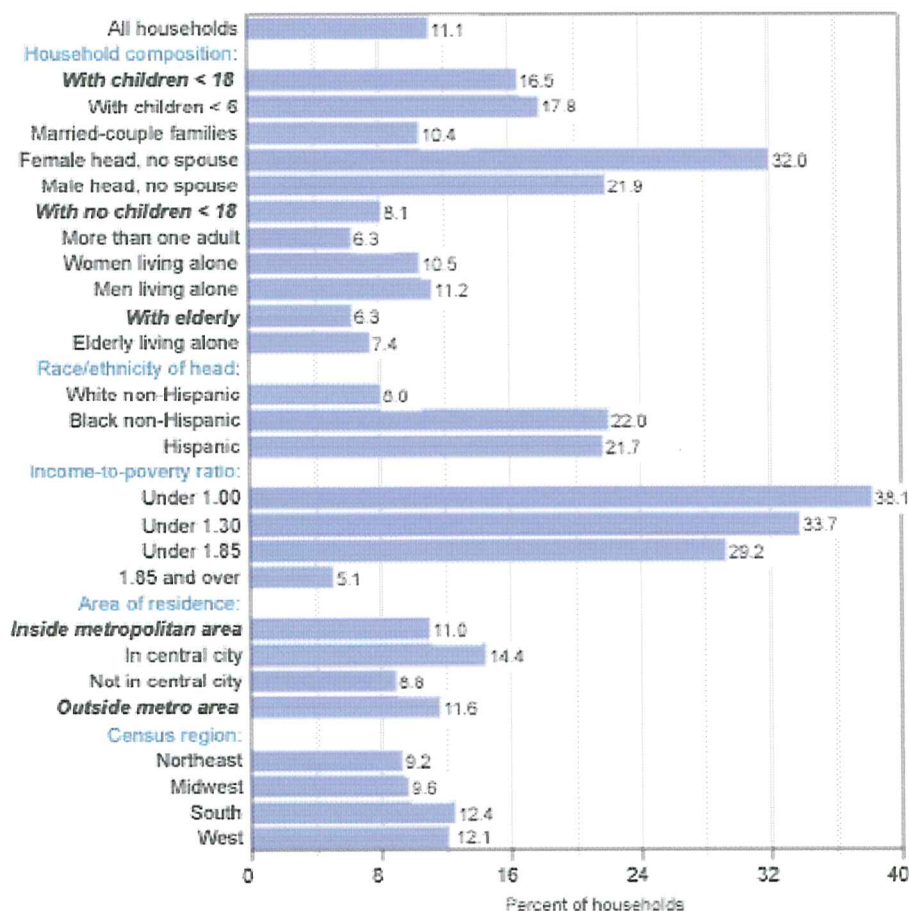
	United States	Louisiana
Non-metro per capita income (2000 dollars)	\$21,858	\$18,629
Non-metro poverty rate (%)	14.6	23.7
Statewide poverty rate (%)	12.4	19.6
Non-metro unemployment rate in 2001 (%)	4.9	8
Statewide unemployment rate in 2001 (%)	4.8	6

As evidenced during 2000-2001, Louisiana exceeded the national averages for both poverty and unemployment rates. The state also had a higher prevalence of food insecurity during this time period. Statistics from Nord et al. (2002) show that the average total of U.S. food insecure households (with or without hunger) was 11.1 percent (Figures 2-4), whereas Louisiana's average was 13.1 percent (8). However, the prevalence of households experiencing food insecurity with hunger was lower for Louisiana (2.9 percent vs. the national average of 3.5 percent). In some 265,000 national households (0.7 percent of households with children), food insecurity was sufficiently severe that one or more children in each household were also hungry on one or more days during the year because the household lacked money for enough food (8).



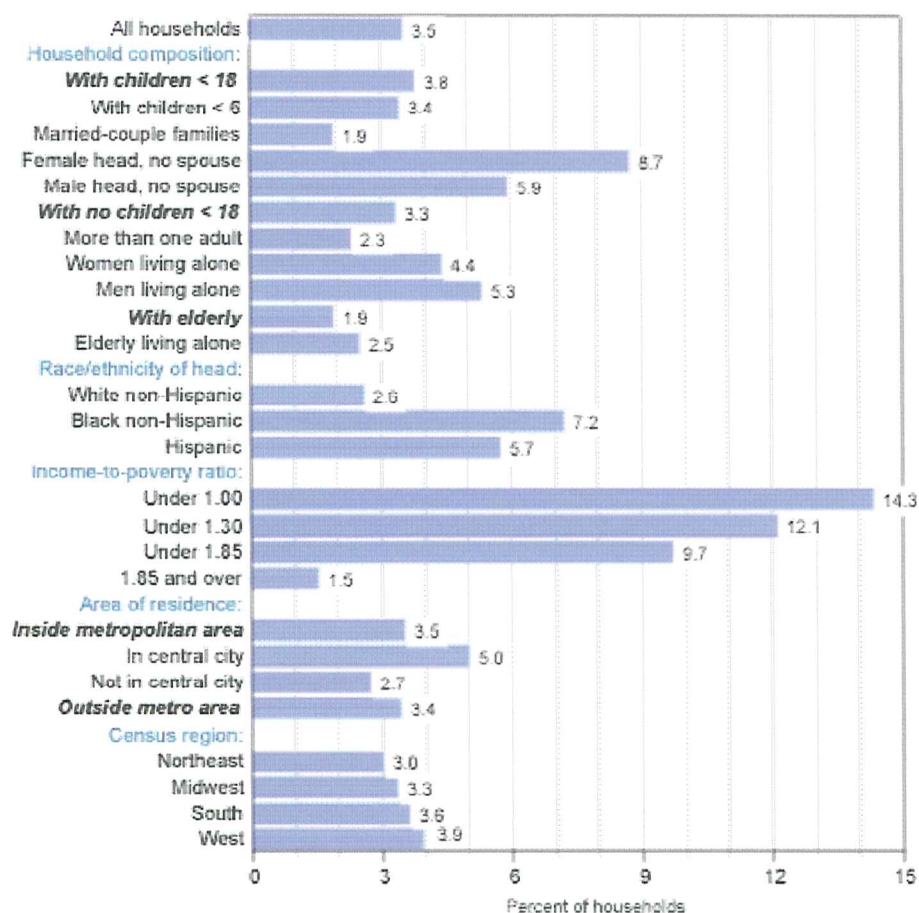
Source: Calculated by ERS using data from the December 2002 Current Population Survey Food Security Supplement.

Figure 2. Food security status of U.S. households, 2002 (123)



Source: Calculated by ERS based on Current Population Survey Food Security Supplement data, December 2002.

Figure 3. Prevalence of food insecurity, 2002 (123)



Source: Calculated by ERS based on Current Population Survey Food Security Supplement data, December 2002.

Figure 4. Prevalence of hunger, 2002 (123)

At-Risk Groups

Food security is not accessible to all facets of the population. It takes into account both community and individual resources including adequate income, access to transportation, cooking and storage facilities, as well as the existence of competitively priced foods, nutritious culturally acceptable food choices and adequate local conventional food sources (9). Therefore, those individuals unable to procure necessary resources become food insecure.

Published research has identified several attributes common to food insecure households. Townsend et al. (10) found that food insecurity is related to a number of independent variables in bivariate analyses as follows: income ($p < .001$), education ($p < .001$), occupation ($p < .001$), region of the country ($p = .002$), urbanization ($p = .009$), ethnicity ($p < .001$), age ($p < .001$), household size ($p < .001$), welfare status ($p < .001$), food stamps ($p < .001$), total energy intake ($p = .003$) and television viewing ($p = .002$). Rose, Basiotis and Klein (11) also found higher rates of food insecurity among households with these characteristics: low income, renting a home, single-head of household, low educational level, six or more people in the household, and minority race or ethnicity. Hunger rates are higher than the 3.5 percent national average among Black and Hispanic households³ (7.2 and 5.7 percent, respectively), households below the poverty line⁴ (14.3 percent) and those in the South and West (3.6 and 3.9 percent, respectively) (8).

Regardless of the combination of the aforementioned qualities, if a single female heads a household, it is often food insecure. Female-headed households with children

³ Non-Hispanic Black and Hispanic households are three times as likely to be food insecure as non-Hispanic White households (12).

⁴ Significantly more Blacks than Whites live in households with incomes that are at or below the poverty level (61.7 percent vs. 22.5 percent, respectively) (13).

and no spouse are more than three times as likely to be food insecure as married-couple households with children (12). Low-income, single mothers with children are especially vulnerable to both food insecurity and hunger; 47.0 percent of these households are food insecure, including 13.4 percent in which one or more persons, usually the mother, is hungry at times during the year because of lack of money or other resources for food (8). Tarasuk (14) reported that twenty-five of the women (24 percent) in her research said that they had run out of money for food because they had to pay bills for essential services (*e.g.*, rent, electricity, telephone) or pay off an accumulated debt (*e.g.*, money owing for telephone services or utilities). Although not explicitly asked, 18 of 44 women who said they simply did not have enough money to meet their needs explained that they ran out of money for food at the end of each month (14). Furthermore, women with longstanding health conditions and those with activity limitations are two to three times more likely to report household food insecurity with hunger over the past 30 days or 12 months compared with women not reporting such problems (14). Based on these investigations, a female-headed household compounded by minority race and poverty should ultimately serve as the prototypical food insecure household.

Rural Food Insecurity

Although hunger and food insecurity are often viewed as “inner city” problems, Andrews et al. (15-16) illustrated that food insecurity can be a large problem in rural areas as well. Job opportunities are limited, and those that are available pay low wages and entail labor-intensive work. Thus, poverty is not uncommon. Rural areas have special characteristics that can make poverty more tenacious (17). Morris, Neuhauser and Campbell (18) have examined three factors that may limit food acquisition and

therefore contribute to food insecurity in rural areas: limited supermarket availability, limited food item availability, and higher relative costs of United States Department of Agriculture (USDA) Thrifty Food Plan (TFP) market basket of foods. Furthermore, a number of surveys have described hunger problems that are exacerbated by the relative isolation and the lack of emergency food services in rural areas (18).

The rural poor have fared relatively badly since 1980 as the economic performance of rural areas has lagged behind that of the rest of the nation (6). From a study of single mothers living in the rural South, Brody and Flor (19-20) found that 82 percent of the families in their sample lived at or below the poverty level. Non-Hispanic Blacks had the highest incidence of non-metro poverty with a rate of 31.4 percent; the incidence of non-metro poverty for Hispanics and non-Hispanic Blacks was significantly more than two times greater than the rate for non-Hispanic Whites (21).

Food Choice

Food insecurity is a characteristic of diet that can affect health and quality of life directly or through nutritional status by limiting the variety of foods available and resulting in the consumption of high-energy, low-cost foods (4,22). Diets of food insecure women have been shown to include fewer fruits and vegetables and to be deficient in a variety of nutrients compared with those who are food secure (4). For example, food frequency data from a sample of 193 women with children in New York State revealed a progressive decline in weekly consumption of fruit, salad, vegetables, fruit juice, carrots, and the sum of all six⁵ fruit and vegetable categories in relation to increasing insecurity (2,14,23). To further compound the issue, the food insecure live in areas where supermarkets are scarce, and grocery stores have difficulty carrying some of

⁵ Fruit juice, fruit, salad, potatoes, carrots, and vegetables.

the perishable items that are needed through the month (20). Homes may have inadequate cooking or refrigeration facilities and therefore, cannot prepare and store foods safely (20).

Because lack of food security often results from inadequate income to purchase food, several coping strategies exist. A study of women's hunger experiences revealed a "managed process" of coping mechanisms, such as eating the same foods all week; cutting portions a little each day; sending children to play at a friend's house at mealtime; and using unsuitable, cheap, or unsafe foods (24). Food safety issues were also implied; one participant said her family gathered "roadkill" when it was available (24). Research among households whose incomes were at or below 185% of poverty level found that those with a greater hunger index score use a greater number of coping strategies, which may be progressive in nature (*e.g.*, living with family versus eating garbage as a last resort) (24).

Food choice and coping strategies differ somewhat in the rural food insecure. These individuals experience more social exclusion and are forced to adopt food consumption patterns and food acquisition strategies that fall outside the social norms (14,25-28). In one rural location, Hoisington (24) found that domestic food production activities (*e.g.*, canning or preserving homegrown⁶ foods, hunting and fishing, raising meat, and food gathering or foraging) were critical in providing food.

Further, Shotland and Loonin's (29) review suggests that impoverished rural residents experience more nutritional problems than higher-income individuals and, often, more problems than the urban poor. This may arise from limited access to safe and

⁶ Shotland and Loonin (29) note that family gardens may have only limited potential for solving problems of food insecurity in the rural population subgroup because of the limited land available for gardening and the high cost of inputs such as seed, fertilizer, and insecticides.

nutritious foods. Research of supermarkets conducted by Morris et al. (18) found not only a limited variety of fresh produce and meats but also a small quantity of each item. Produce appeared over-ripe or damaged, a condition related to the lack of produce refrigeration space (18). Impoverished food insecure individuals, thus, would not deem their food selection appealing and opt for the more shelf-stable, inexpensive, low-nutritive value items.

Food Programs

Thrifty Food Plan

The TFP was developed by the USDA Center for Nutrition Policy and Promotion with assistance from the ERS and the Food and Nutrition Service (FNS), which are also part of the USDA (30). It serves as a national standard for a nutritious diet at a minimal cost and is used as the basis for food stamp allotments (31,32). Food stamp benefit levels are based on the nationwide cost of a TFP market basket developed for a representative family of four, including two adults with two school-aged children (31). Each month, the cost of a TFP basket is updated using the Consumer Price Indices (CPI) for different food categories. Morris (18) reports that the TFP determines the cost, type and quantity of food needed by males and females of different ages to meet minimum dietary standards, although it actually supplies less than the Recommended Dietary Allowance (RDA) for certain nutrients. In other words, the TFP food budget reflects a diet that is just barely adequate, designed for short-term, *emergency* use by a family when its resources are very low (9).

An advantage of using the TFP shopping list (Appendix C) to gauge food availability is that the list contains specific items that can be identified and standardized across most food stores (31). The disadvantage is that the list may not be representative

of food patterns in a particular area; for example, stores in low-income areas of the South, unlike similar stores in other areas, may stock cornbread but not bagels (31). The TFP allowances do not take into account the higher cost of groceries in inner cities, regional price differences, or the costs and difficulties of transportation, and they assume adequate storage space and a high level of time and skill devoted to food preparation (9).

Nord et al. (8) found that median food expenditures relative to the TFP are lower for Black households and Hispanic households than for non-Hispanic White households. This finding can be attributed, in part, to the higher poverty rates of these minority groups. The median spending on food is also slightly lower in the more impoverished South than that for households in the Northeast (8).

Food Stamp Program (FSP)

One of 15 food assistance programs funded and overseen by the federal government, the FSP is the nation's largest nutrition safety-net program for low-income people (12,33). The FSP is an entitlement program with eligibility and allotments based on income, household size, assets, housing costs, work requirements, and other factors (1, 17). In 1996, qualification requirements became more stringent under the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA). Under this new law, many legal permanent residents and single adults without children became ineligible for food stamps. The PRWORA also placed an overall five-year limit on receipt of benefits for most recipients and transferred primary responsibilities for design, implementation, and oversight of welfare programs to state and local governments (12,16). Efforts also commenced to encourage recipients to become more self-sufficient. Nutrition education and promotion activities were implemented into the FSP in order to

help provide millions of low-income children and families with the skills, information, and motivation necessary to support healthful eating (34).

FSP participation has declined since the 1990s, while private emergency assistance over the same period has increased. It appears that Temporary Assistance for Needy Families (TANF) and FSP beneficiaries are relying more heavily on food from private emergency sources such as food pantries, soup kitchens, and shelters (12). Research on the characteristics of recipients of emergency food assistance reveals that a substantive number who receive food stamps run out before the end of the month (9,16). This is due, in part, to food stamp benefits lagging 3 to 15 months behind the actual cost of the TFP in any year, resulting in an average 5 percent shortfall in benefit allotments (18). Therefore, consuming a nutritious diet may be impossible for the impoverished food insecure.

Since most program offices are located in urban areas, rural food insecure individuals may not regularly supplement their incomplete diets. In fact, research has identified concerns regarding the difficulty with obtaining food stamps and the lack of accessible or viable assistance programs of other kinds in rural counties, where transportation is commonly a problem (35,36). Rank and Hirsch (37) have also shown that qualified families in rural areas are much less likely to participate in food assistance programs, such as food stamps, because of adverse attitudes toward welfare and lack of accurate information.

An early economic analysis of the FSP in rural areas of central Pennsylvania has given attention to the timing of receipt of food stamp benefits and cash income into the household (38). Mean daily expenditure per person on food at home peaked sharply in

the first three days of the food stamp month and flattened out at a much lower level for the remainder (38). A one-tailed t-test found that the difference between food energy intake in the first week and the fourth week was statistically significant at the 0.05 level (38). This monthly cycling—not exclusive to rural food stamp recipients—illustrates the intrinsic problems of the FSP.

Emergency Food Assistance

Before the 1980s, private food aid in this country was largely limited to soup kitchens in urban areas; now, private emergency food systems are expanding to offer a wider variety of food assistance (17). The Emergency Food Assistance Program (TEFAP) is a USDA program under which commodity foods are made available to states (39). The foods are then distributed to food banks, food pantries, and soup kitchens operated by nonprofit agencies or churches (9). The original intention for the TEFAP system was for *short-term* use by clients. However, the use of the emergency food system has become a necessity, a routine—not a temporary means of crisis management (9). Duffy (16) found that most food pantry clients receive food at the food pantry for several months, indicating a long-term need. This finding may indicate that the rise of food banking nationwide is a sign of increasing food insecurity, especially in the wake of welfare reform and the sudden drop in food stamp use (9,16). Nord et al. (8) found that about 70 percent of households that obtain emergency food from community food pantries are food insecure, and more than one-third are food insecure with hunger. Food pantry use is especially high among female-headed households with children (9.7 percent) and Blacks (6.6 percent) and Hispanics (4.5 percent), which is consistent with

the higher rates of poverty, food insecurity, and hunger found in these minority groups (8).

For those who view government assistance as cumbersome and ineffective, food banks may appear to be the best solution to the hunger problem (17). Even though they cannot provide the same variety and amount of food received from food stamps, the personal, informal nature of the program may be more appealing to some clients than the bureaucratic structure of the FSP (16). This is especially relevant in rural locales, where poverty and food insecurity dominate. Among residents of rural areas, where a high value is often placed on independence, admitting the need for food assistance may be especially difficult (17). However, rural organizations tend to be small-scale operations affiliated with churches. Rural ministers play an important role in identifying hunger as a congregational issue, seeking association with food banks and organizing the outreach effort (17). Some rural pantry directors deliver food to those who cannot drive or do not have transportation, as most rural inhabitants do not live within walking distance of a food pantry (17,40).

Nonetheless, food banks and pantries have critics (17). Hilton (41) argues that food banks contribute to the cycle of dependence and poverty, which leaves many people feeling hopeless. Based on two samples from upstate New York and New York City, Thompson et al. (42) reported that the mean number of meals served weekly in soup kitchens follows a sharp sawtooth pattern over the year, with a peak at the end of almost every month. This need for emergency aid most likely arises from food stamp cycling, in which recipients fail to budget their monetary allowance, thus exhausting it prior to the end of the month. Some also view food banks as part of the long-term poverty problem

because they shift the focus away from the structural inadequacies of the welfare system and government's responsibility to create viable economic opportunities for its citizens (17).

Food Consumption Patterns in the Black Community—

History

Food choice has long been recognized as a process that involves psychological, social, cultural, economic, and biological forces (20,43-47). Over a lifetime, these forces interact with a person's life course events and experiences to result in individual preferences (such as taste) and other considerations (such as convenience or finances), which shape food behavior (43,45,48-51). Thus, not everyone with identical traits makes identical food choices (45).

Particularly important to the modern Black community is the sociocultural aspect to food choice. Blacks comprise a diverse array of peoples (Bahamians, Haitians, Cubans, Northerners and Southerners), from a wide array of class and educational backgrounds, who may be exposed to very differing health perspectives (52). Mainstays of Black food patterns, including those in Louisiana, have drawn on eating habits of several cultures: that of seventeenth and eighteenth century West Africans, culture associated with American slavery, and the culture of the post-Civil War rural South (53-55). In Tuskegee, Alabama and the "Black Belt," at the beginning of the 20th century, few Black people owned land; most rented between 20 and 60 acres. Tenants generally had at least one mule or an ox, and most owned at least one pig and some chickens; only a few had gardens for growing collards, turnips and other vegetables. This meager existence forced Blacks to eat any food available for consumption. Sweet potatoes were

popular; they appeared in 47 percent of Black dietaries. Collards or turnips were occasionally boiled with pork fat because the fat made the vegetables taste “rich.” These traditional, rural “soul foods” (Table 2) were eventually deployed as symbols of Black pride and identity during the 1960s (56).

Table 2. Typical annual diet, Tuskegee, 1895-1896 (56)

	Meat and Dairy	Grains and beans	Fats, oils, sugars, starches	Roots and tubers	Other vegetables
Primary core		Cornmeal Flour (wheat)	Bacon Lard Sugar Molasses		
Secondary Core	Pork ^{2,3} Milk Buttermilk		Butter	Sweet Potatoes	Greens ²
Periphery	Eggs	Rice Cowpeas ⁴			

2 Various cuts or types

3 Fresh

4 Dried

Current research has found adherence to this “Black eating pattern.” Devine et al. (57) reported that Latinos and Blacks are more likely than Whites to report explicitly that they enact ethnicity through food on a more frequent basis, expressing their traditions in Sunday (or even more frequent) gatherings of family and friends. Kumanyika and Ewart (58) found that certain Southern food preferences and traditional food preparation practices might persist among older Blacks. In some cases, food becomes a battleground for ethnic differences in families in which older family members want to maintain traditions, and younger members develop ties to a wider culture (57).

The desire of the elders to maintain identity persists because of the close social ties within the Black community. Commensality, the process of eating together or giving

and receiving food, commonly takes place in this group and reinforces social relations and memberships (59). Quandt (59) noted that virtually all food sharing in rural locales takes place within social networks, which are often synonymous: neighborhoods are made up of extended kin groups, and these form the basis for churches. Studies elsewhere have shown that types of food sharing reflect the degree of intimacy of social relations (60). In fact, social networks are usually made up of a single ethnic group, making it unusual for food sharing to take place across ethnic groups (59). Therefore, unmodified traditions and identities are passed to subsequent generations, and cultural bonds are strengthened.

Current Diet

While “soul foods” may be essential to food selection and eating behaviors among some Blacks, it is still important to identify the contexts in which food is selected and how these contexts influence food intake in this high-risk group (47). Hargreaves (47) found that, instead of seasonal and urban/rural factors, today’s contextual factors include the ubiquitous availability of fast, snack and convenience foods. In fact, large corporations target Blacks with their advertisements, and fast food chains locate their stores in predominantly Black neighborhoods (47). This blatant commercialism has led to the adoption and propagation of poor nutrition within the Black community.

Because Blacks associate a higher cost with a healthy diet, they typically adapt to consuming available foods in order to survive (24,90-91). Unfortunately, Blacks have implemented a diet deficient in fruits and vegetables (53,63,92-95). Patterson et al. (96) found that only about 5 percent of Black women consume the recommended numbers⁷ of

⁷ The National Cancer Institute (NCI) recommends at least five servings of fruits and vegetables per day (97).

both fruit and vegetable servings. Mean numbers of servings of fruit (1.08, standard error [SE]=.03) and vegetables (1.77, SE=.02) are far below the recommended levels and are lower for Blacks than for Whites (96). Since fruits and vegetables serve as good sources of vitamins and minerals, Blacks are also missing key micronutrients. Potassium, calcium⁸, magnesium, and vitamins A and C are significantly lower in the diets of Black women (13,17,98-100). Blacks, particularly those in the South, also consume more fat, sodium, and total calories because of their food choices, which consist of animal fats, beef, sausage, and fried meat (13,58,72,101). Thus, a group with special needs, such as this minority group, would benefit from nutritional intervention and guidance.

Maternal Behavioral Modeling

The concept of behavior modeling is a powerful motivator for parents, who learn that children mirror their behavior (61). This concept may be of particular importance in the Black community, where family has an important emphasis (61). Backman et al. (62) found that the mother is the most influential individual regarding healthful dietary behavior in adolescents. Mothers assume a dominant and pivotal role in performing health-related activities for all family members and may set the standard for the development of healthy lifestyle habits within the family environment (20,63-64). Daughters have been found to have similar dieting behaviors as their mothers, and maternal modeling, verbal feedback, and attitudes about eating have been observed to have a significant impact on adolescent girls' weight concerns and dieting behaviors (63). If low-income Black mothers equate heavy weights with health, financial security, or power, they may be less motivated to encourage their daughters to eat low-fat foods and to exercise regularly in order to maintain lower weights (65). In fact, Black girls with

⁸ In addition, Blacks are almost twice as likely to report consumption of no dairy products as Whites (102).

mothers that report high fat intake represent a group of preadolescents at highest risk for health-compromising dietary behaviors (63). However, increases in nutrition-related knowledge have led to improvements in children's diets (34,66). Several studies have noted that parental support and role modeling is positively related to mother's fruit and vegetable intake and decreases in dietary fat among Hispanic and Black groups (61,67-68).

Youth

Dietary intakes and eating patterns of young adults are of special interest because young adulthood is a critical age of childbearing and sets the stage for lifestyles that influence later health (69). Thus, early exposure to a healthful diet should ensure adherence to proper nutrition throughout an individual's life course. Unfortunately, today's youth are consuming dietary excesses of total fat, saturated fat, cholesterol and sodium, while not meeting recommended intakes of fruits and vegetables (69). Deficient intakes of essential nutrients, such as calcium, iron, magnesium, zinc, folate, and vitamins A, B6, C and E, have been reported, and these inadequate intakes are found in a larger proportion of young women than young men (69). Black participants consume more energy and a higher proportion of energy from fat than their White and Hispanic counterparts (62). Black youth typically consume breakfast foods high in total fat and saturated fat (*e.g.*, whole milk, sausages, bacon, salami, fried or scrambled eggs, and added fat from margarine and butter) (69). However, participants in Backman's research indicated that eating more servings of fruits and vegetables and limiting energy intake have a stronger association with the intention to eat a healthful diet than consuming less

energy from fat (62). This nutrition knowledge, while limited, indicates that these young adults have the capacity to adopt a more healthful diet.

24-Hour Recall Diet Assessment

Although no consensus exists regarding collection of dietary information from adults of lower educational levels, 24-hour recall techniques are regarded as the most reliable method of obtaining diet and nutrition information among groups of people (70-72). When collecting a 24-hour diet recall, an individual is asked to recall all foods and beverages, including amounts and descriptions, consumed in a 24-hour period (73). Thus, the 24-hour dietary recall is preferred because it is person-specific and provides comparable estimates to more intensive methods like food records (74). Other strengths of using the 24-hour diet recall method include quantification of food intake, short administration time, convenience in interviewing illiterate subjects, and opportunity for telephone administration (73). Several studies have investigated the latter and found that telephone-administered dietary methodology produced acceptable estimates of the means and distributions of nutrient intakes among groups of individuals (73,75-77).

However, utilization of the 24-hour recall to gauge an individual's dietary intake is not infallible. This type of dietary assessment is costly and requires motivated subjects and trained interviewers (74,78). Subjects tend to underreport high intakes of non-nutritious foods (72,77-79,82-84). For example, the University of Arizona's Garbage Project revealed consistent underreporting of culturally undervalued "indulgent" behaviors (*e.g.*, alcohol consumption, high fat snacks, sugared cereals, cookies) (82). When employing doubly-labeled water and various other biological markers, overweight females are consistently associated with greater underreporting of energy intake (80-

83,85-86). Researchers have attributed this gender-specific underreporting to a stronger social desirability in females (16,82,87-88). Specifically, food insecure women with children tend to underreport if the mothers perceive that it would reflect badly on them as caregivers if they were not providing enough food to their children (16,87). It is also worth noting that racial differences have been reported for the social desirability with Blacks having a significantly greater mean value than Whites (82).

To lower the incidence of underreporting, a slightly modified method, called the multiple-pass 24-hour diet recall, is used (76). This technique is designed to provide respondents with multiple cues and opportunities to report their food intake (76,81,89). It consists of three distinct passes: the quick list, detailed description, and review (81). Research by Johnson et al.⁹ (81) and Tran et al. (89) found that the multiple-pass 24-hour recall does not generate a group measure of energy intake that is accurate or unbiased. However, this method ranks superior to the single-pass method because it allows the participant more time to remember foods consumed during the past 24 hours (79).

Barriers to Healthy Eating

Several barriers exist that limit the degree to which adults and children follow a healthful diet. Perishability, inconvenience, cost, difficulty in selection or storage, time in preparation, dislike, lack of transportation, unwillingness to replace other foods with fruits or vegetables, poor availability, lack of family support, and difficulty in replacing old habits have all been mentioned as significant constraints (47,53,92,95,103,104).

Barriers are typically higher in Blacks and Hispanics, those with less education, those with lower incomes, and those in labor, service, or paraprofessional occupations (95).

⁹ Mean energy intake was significantly lower than mean total energy expenditure (2197 ± 607 versus 2644 ± 503 kilocalories, $p = .001$) (81).

Based on these criteria, Black rural inhabitants likely experience difficulty in achieving a nutritious diet. In fact, use of and access to health and community services in rural areas are more difficult, and access to food sources is limited compared to that in urban areas (105). This often arises from inadequate or non-existent transportation.

The poor, in general, have lower rates of car ownership per capita and must rely on various kinds of car pools or public transportation (9). The latter is not feasible for those living in non-metro areas, thus one must either share rides or possess his/her own vehicle. Unfortunately, in order to qualify for food stamps, a family cannot have more than \$2000 in assets, including the value of a car beyond a set-aside of \$4550 (17). This makes it very difficult for rural inhabitants to patronize supermarkets, which ordinarily offer food products at much lower prices than corner grocery stores.

Past research suggests prices at small stores run an average of 10 percent more than at supermarkets, which take advantage of economies in procurement and retailing (32). Corner groceries also carry poorer quality food and fewer food choices (18,59,103). Morris et al. (18) found that 23 percent of small/medium stores did not stock any fresh vegetables, and one out of three stores stocked no fresh fruits. These small stores may have limited fresh produce based on the fact that rural inhabitants tend to associate higher monetary costs with healthful eating, including fruit and vegetable consumption (13,62, 102,106). Morton and Guthrie (34) showed that 71 percent of low-income respondents with children consider price very important, compared with 36 percent of higher income respondents with children. Low-income respondents are significantly less likely to follow several low-fat and low-cholesterol eating practices in which fruits and vegetables

play a major role (34). Cost aside, food from the fruit, dairy¹⁰, grain, and vegetable groups may not be perceived as important or as palatable as the meat group and may be replaced by alternatives (*e.g.*, substituting fruit drinks for fruit juices and fruits and sweetened pastries for breads) (102). Morton and Guthrie (34) found that low-income individuals are also significantly more likely to eat chips four or more times per week in place of more nutritious choices.

Diet and Disease

Blacks are at increased risk for cancer and other chronic diseases as a result of dietary patterns that include high consumption of fat, total energy, sodium and cholesterol, and low consumption of fruits and vegetables¹¹ (13,47,61,107-109). In addition, minority women are at greater health risk and have shorter life expectancies than White women, who are significantly more likely than Black women to agree that diet can cause health problems (13). Few Black women are aware that controlling body weight and sodium intake are important measures in preventing hypertension (110). Furthermore, Black women are notably less likely than White women to correctly identify foods high in fat and cholesterol, which may account for the higher rates of obesity, hyperlipidemia, and hypercholesterolemia detected in this subset of the population (13).

Several researchers have posited that this laissez-faire attitude arises from two sources—culture and psychology. First, the cultural obligations associated with the food-gatekeeper roles of Black women may interfere with the motivation to make certain

¹⁰ Perceived negative taste is also a barrier to the consumption of high-calcium foods, such as milk, cheese and yogurt (71).

¹¹ Campbell et al. (93) found a protective effect from fruits and vegetables that may be attributable to multiple factors, including a variety of antioxidants and anticarcinogenic compounds.

changes in food preparation for themselves or other family members (58). Devine et al. (57) reported that changes in health status sometimes bring about conflicts between ideals about food and advice from health professionals, forcing respondents to break with their ethnic food ideals, often with personal and social consequences.

Psychology, somewhat interrelated to culture, also serves an important role in perpetuating this nutritional ignorance. Ferraro (107) has found that Black women are more pessimistic and fatalistic about their health and engage in fewer efforts to promote their health than White women. This is due, in part, to an external locus of control that mediates stress, placing the failure to achieve good health outside of one's control and unfortunately, undermining adherence to biomedical recommendations (52).

Overweight and Obesity—

Definitions and Assessment Tools

Overweight refers to increased body *weight* in relation to height, when compared to some standard of acceptable or desirable weight (124-126). Conversely, obesity is defined as an excessively high amount of body *fat*¹² in relation to lean body mass (124-128). The amount of body fat includes concern for both the distribution of fat throughout the body and the size of the adipose tissue deposits (126).

Overweight and obesity can be distinguished from one another by different values for two common measures—body mass index and waist circumference. Body mass index (BMI), or Quetelet's index (Figure 5), describes relative weight for height and is significantly correlated with total body fat content (129-133). Desirable BMI levels vary

¹² Body fat normally accounts for approximately 25 percent of weight in females and 18 percent of weight in males (127-128).

with age, but Tables 3 and 4 show the most common values (*i.e.*, for those individuals aged birth to 19 years and those over 20 years).

$$\text{BMI} = \left(\frac{\text{Weight in Pounds}}{(\text{Height in inches}) \times (\text{Height in inches})} \right) \times 703$$

$$\text{BMI} = \frac{\text{Weight in Kilograms}}{(\text{Height in Meters}) \times (\text{Height in Meters})}$$

Figure 5. BMI formula variations (134)

Table 3. BMI chart for adults over 20 years of age (135-136)

BMI	Weight Status
Below 18.5	Underweight
18.5 – 24.9	Normal
25.0 – 29.9	Overweight
30.0 – 34.9	Obesity Class I
35.0 – 39.9	Obesity Class II
40.0 and above	Obesity Class III

Table 4. BMI chart for youth (under 20 years of age) (136)

BMI-for-Age	Weight Status
< 5 th percentile	Underweight
85 th percentile to < 95 th percentile	At risk of overweight
≥ 95 th percentile	Overweight

Unfortunately, BMI has limitations. It does not distinguish between overweight resulting from obesity and that resulting from muscular development (133). For example, a bodybuilder with a large muscle mass and a low percent body fat may have the same BMI as a person who has more body fat (135). Skinfold measurements taken by a trained professional should accompany BMI calculations whenever possible (133). Moreover, self-reported weight and height data used to determine BMI may underestimate weight and overestimate height, resulting in an underestimation of both BMI and the prevalence of obesity (4). This phenomenon has been studied extensively, and researchers agree that, in the absence of *measured* weight and height, self-reported values are sufficiently accurate (138).

Experts currently combine waist circumference (WC) measurements with BMI to assess an individual's risk for health complications secondary to obesity. The WC is measured at the most narrow area below the rib cage and above the umbilicus as viewed from the front (133). If there is no apparent area of least circumference, the measurement should be taken at the level of the umbilicus (133,139). WC standards used for the general population may not apply if a person has short stature (under 5 feet in height) or has a BMI ≥ 35 (126).

WC is a useful tool for measuring abdominal obesity, which the Centers for Disease Control and Prevention (CDC) defines as equal to 102 cm (>40 inches) in men and 88 cm (>35 inches) in women (126,140). The presence of excess body fat in the abdomen, when out of proportion to total body fat, is considered an independent predictor of risk factors and ailments associated with obesity (126,128,139-140). Recent studies of Westerners with high BMIs have suggested that elevated C-reactive protein levels are

associated with body fat, especially visceral adipose tissue (141). Furthermore, Wang and Hoy (142) found that WC appears to be a better predictor for cardiovascular risk than other parameters (*e.g.*, BMI, waist-to-hip ratio, and hip circumference).

Prevalence

Overweight and obesity have become global health concerns and the focus of much research in the United States, where the prevalence of both conditions continues to increase (Figures 6-7). In 1991, only 4 of the 45 states participating in the Behavior Risk Factor Surveillance System (BRFSS) survey¹³ had obesity prevalence rates of 15 to 19 percent, and none had prevalence greater than 20 percent (145). Eleven years later, in 2002, 18 states had obesity prevalence rates of 15-19 percent; 29 states¹⁴ had rates of 20-24 percent; and 3 states had rates over 25 percent (Figure 8) (145). It is not surprising, then, that among adults aged at least 20 years in 1999-2002, 34.7 percent were overweight; 25.5 percent were obese; and 4.9 percent were extremely obese (146). The BRFSS survey also found a rising prevalence of Class III obesity among adults (147). Of particular concern, though, was the finding that 30.0 percent of children aged 6 through 19 years were at risk for overweight in 1999-2002 (146).

¹³ Results from the BRFSS are limited because all data are self-reported.

¹⁴ The State of Louisiana had prevalence rates of 15.7 and 23.3 percent in 1991 and 2001, respectively (145).

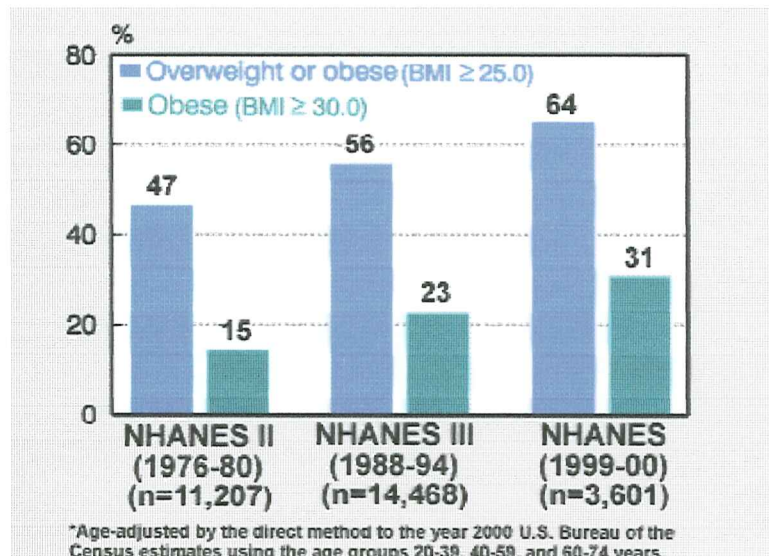


Figure 6. Prevalence* of overweight and obesity among U.S. adults, ages 20-74 years (143)

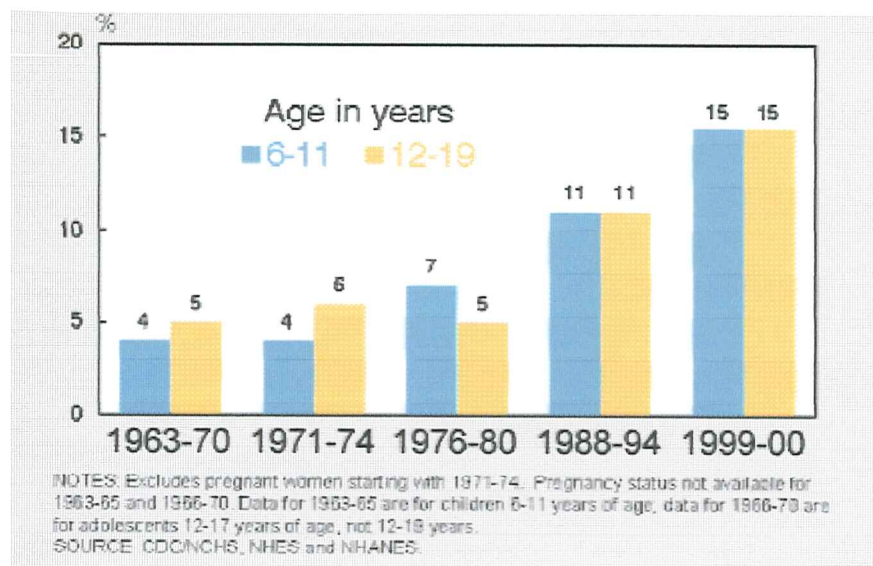


Figure 7. Prevalence of overweight among children and adolescents, ages 6-19 years (144)

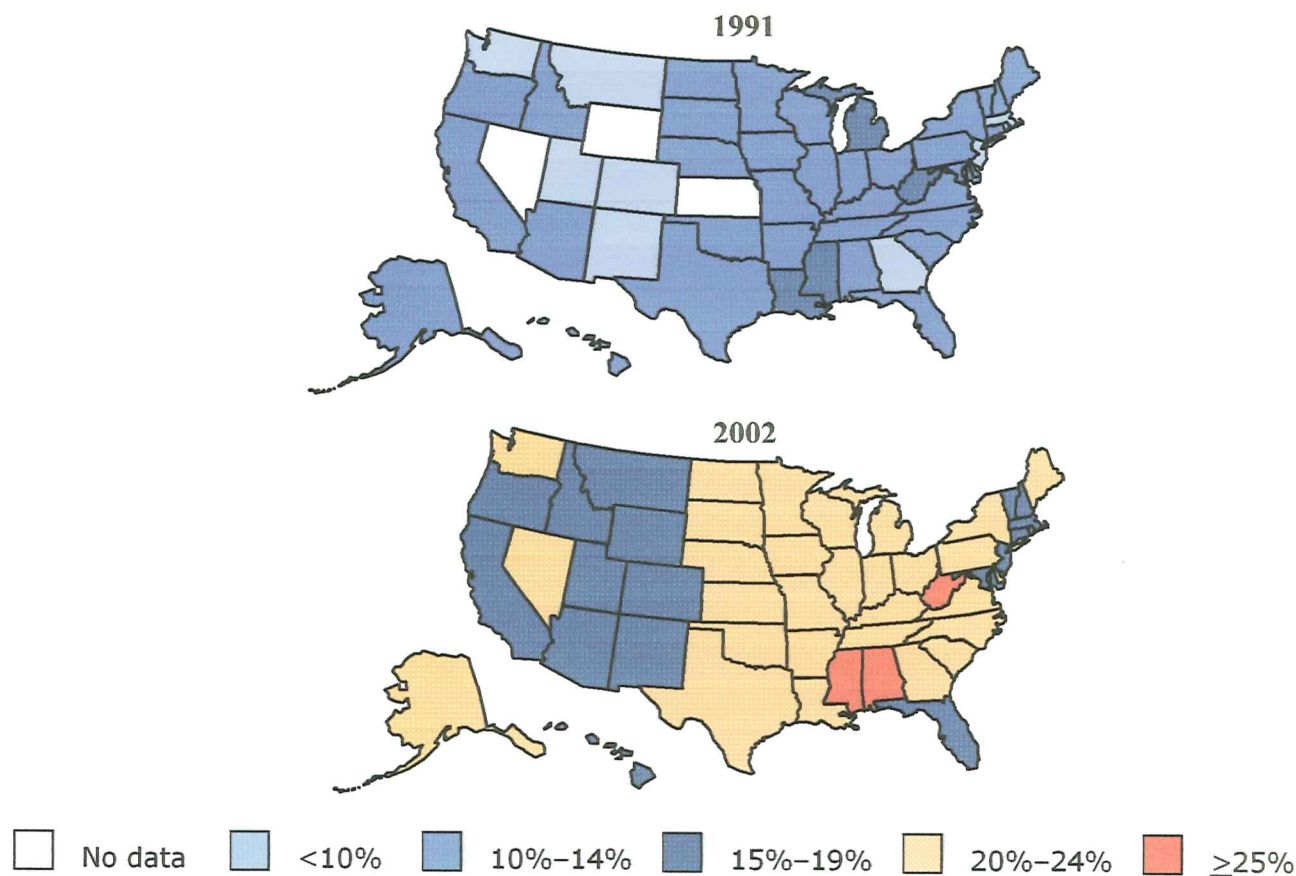


Figure 8. U.S. obesity trends map, 1991 and 2002 (145)

National Health and Nutrition Examination Survey (NHANES) results indicate continuing disparities by sex and between racial/ethnic groups in the prevalence of overweight and obesity (146). With the exception of Asian Americans, the prevalence of overweight and obesity is higher in racial-ethnic minority populations, especially Black people, than in U.S. White people (128,138,148-149). At the center of this problem is the Black woman¹⁵, who has been described as the “fattest of them all” (63,70,152-54).

A multitude of research exists that has supported this propensity of Black women toward overweight and obesity. In 2000, more than 65.8 percent of Black females were

¹⁵ It is interesting to note that the weight discrepancy between Black and White females does not widen until adolescence (65). The prevalence of obesity in these women increases until late middle age and decreases thereafter (150-151).

overweight or obese, whereas 49.2 percent of White females were overweight or obese (153-155). Caldwell et al. (156) found that a significantly higher percentage of Black women in their study were in higher BMI categories, and a significantly lower percentage were in the lower BMI categories ($p=.000$) when compared to White women. Research by Gates and McDonald (13) further strengthens this observation. They reported that their Black female participants also had significantly higher BMIs than White women ($p<.0001$) when the result was evaluated using analysis of covariance to adjust for differences between the groups in age, household income as a percentage of poverty, and education (13). Since Townsend et al. (10) concluded that Black race emerged as the greatest single predictor of overweight in their study ($p<.0001$), it is not unexpected that McTigue et al. (157) reported that 66 percent of Black women with a BMI of 24 to 25 when they were in their early twenties were obese by the ages of 35 to 37 years, whereas 47 percent of Hispanic and 42 percent of White women became obese.

Contributing Factors

When the number of calories consumed exceeds the number of calories burned over a period of time, weight gain is usually the result (153). In severe cases, obesity may eventually develop from prolonged energy imbalance. The causes behind this condition are complex, involving behavioral, environmental, and genetic components (86,153,158-159).

Two primary behavioral, or individually chosen, factors are physical inactivity and pregnancy. Physical activity is any bodily movement produced by skeletal muscles that results in an expenditure of energy with a range of activities, such as occupational work, household chores, or leisure time activities (158). According the BRFSS, in 2000,

more than 26 percent of adults¹⁶ reported no leisure time physical activity (158). This inactivity may result from a lack of motivation or time or the misconception that physical activity is limited to vigorous exercise or sports (158,169). However, even moderate-intensity exercises, such as walking and gardening, promote weight loss. Research has also shown that pregnancy contributes to becoming overweight or obese. High gestational weight gain, Black race, younger age, and low socioeconomic status (SES) have been previously associated with post-partum weight retention (161-164). Results from a study by Wolfe et al. (161) further expand this list by including rural residents; those not working outside the home; those having relatively fewer children; those with less education; nonsmokers; and single females.

Environmental pressures, which often influence behavior, also contribute to the obesity epidemic. Several trends, including the increasing availability of soft drinks and snacks, the advent of technology, and the growing portion size of restaurant meals, have been postulated as possible reasons for the upsurge in obesity (86,152,158). Baturka et al. (165) and Sanderson, Littleton and Pulley (169) reported that inclement weather or the lack of exercise classes/facilities, safe outdoor conditions, or childcare services could also quell an individual's determination to stay physically active.

Behavioral and environmental factors, however, do not explain the race disparity in obesity prevalence, indicating that there are genetic factors that are operational as well (65,148,166). Jakicic and Wing (167) showed differences in resting energy expenditure (REE) with REE being significantly lower in Black women compared to White women. The magnitude of the difference in REE was approximately 506 kiloJoules per day (120

¹⁶ Tuten et al. (160) found that White women have greater mean physical activity than do Black women, who are significantly more sedentary.

kilocalories per day), which, when correcting for the potential difference in body mass content, would suggest that Blacks are less metabolically active compared to Whites (167). The doubly-labeled water method also revealed that total daily energy expenditure is significantly lower in Black women than in White women (98). Despite obesity having strong genetic determinants, the genetic composition of the population does not change rapidly; the large increase in obesity must also reflect major changes in non-genetic factors (168). Thus, the conditions of and contributors to overweight and obesity are exceedingly complex.

Socioeconomic Status and Food Insecurity

The relationship between female overweight and obesity and low SES warrants special attention because the higher prevalence of overweight and obesity and the greater mean BMI among low-income women is supported in the literature (10,83,171-172). Averett and Korenman (173) found that, in comparisons of the socioeconomic attainment of female siblings, an obese woman's family income is about one-third lower; her hourly wage is 12 percent lower; the chance she is married is 23 percentage points lower; and her spouse's earnings, if applicable, are about one quarter lower than her sister of recommended weight. There is also some evidence that low SES leads to psychosocial manifestations, which result from a lack of access to food and the consequent feeling of constraint to go against norms in order to procure food (174). This stress may ultimately produce central obesity through psychoneuroendocrinological pathways (91,234-238).

Not surprisingly, food insecurity has been associated with increased risk for poor nutritional status and poor health outcomes (4,175). Some individuals and policy makers have questioned the validity of the claims of widespread hunger and food insecurity in

the low income population of the U.S. because of the high prevalence of overweight and obesity in this same population subgroup (10,91,171,176-177). Townsend et al. (10) found that of 966 women (915 weighted) reporting mild food insecurity, 41 percent were overweight compared with 34 percent of the food secure population ($p<.05$).

Furthermore, BMI was significantly higher ($p<.05$) for women in the food insecure group in Olson's study (171) compared with women in the food secure group (28.2 vs. 25.6 kilograms per square meter). In addition, 37 percent of the women in the household food insecure group had a BMI>29 compared with 26 percent of women in food secure households (171). More recently, Laraia et al. (178) reported that prevalence of concern about enough food is positively associated with morbid obesity in Louisiana (relative risk=2.20, 95% confidence interval [CI]=1.24,3.90) and New York (relative risk=2.3, 95% CI=1.30,3.84).

Because overweight is usually thought to be associated with excessive food intake, and hunger with an inadequate food supply, thinking in terms of these parameters in the same individual connotes a paradox (10). However, it has been well-documented that monthly food cycling contributes to the overweight or obese status of food insecure females. The food acquisition cycle is characterized by abundant food supplies being available during the first three weeks of the month, followed by one week when food selection is limited (10). During the one-week of deprivation, the food insecure buy cheap, energy-dense foods and may also skip meals¹⁷ (91). However, when both money and food once more become accessible, these same individuals consume food in excess. Studies show that food deprivation in humans and animals and food restriction in

¹⁷ Wilde (38) conducted a one-tailed t-test and found that the difference between food energy intake in the first and fourth weeks is significant at the .05 level.

children produce both a preoccupation with food and the tendency toward binge eating when a plentiful food supply is available (4,10,91,171,179). Overeating by food insecure families when palatable food is plentiful could be a pattern that results in gradual weight gain over time (10). As proposed by Dietz (176), either food choices or physiologic adaptations in response to episodic food shortages could cause increased body fat.

Health and Economic Consequences

According to the *National Institutes of Health (NIH) Clinical Guidelines on the Identification, Evaluation and Treatment of Overweight and Obesity in Adults*, all adults (aged 18 years or older) who have a BMI of 25 or more are considered susceptible to premature death¹⁸ and disability as a consequence of overweight and obesity (128,181). Health risks associated with overweight and obesity include heart disease (4,13,153,161, 166,182-185), hypertension (4,13,138,153,161,165-166,173,182-183,186-187), dyslipidemia (138,153,182), type 2 diabetes (4,13,128,138,148,153,161,165-166,173, 182-188), angina pectoris (153,182,187), congestive heart failure (153,182), stroke (153,182-184), certain types of cancer (*e.g.*, endometrial, colon, uterine, cervical, postmenopausal breast, prostate) (165,173,182-186), gallstones (153,182-183), obstructive sleep apnea (153,182), musculoskeletal disorders¹⁹ (*e.g.*, osteoarthritis) (182-183,185,189), and psychological disorders (153,182,190). However, a graded increase in diabetes, high blood pressure, gall bladder disease, and osteoarthritis is observed with increasing severity of obesity (138,182).

¹⁸ The disease burden of obesity is substantial, with the number of deaths attributed to it estimated at 300,000 annually (128,166,180).

¹⁹ Mehrotra et al. (189) found a strong relationship between body weight and arthritis. According to the BRFSS survey, in 2000, the prevalence of arthritis was 25.9 percent among normal weight (18.5 to 24.9 BMI) adults, 32.1 percent among overweight (25 to 29.9 BMI) adults; and 43.5 percent among obese (>30 BMI) adults (189).

Although the nature of obesity-related health risks is similar in all populations, the particular level of risk associated with a given level of obesity may be different depending on gender, race, and societal conditions (138). Specifically, obesity threatens the health of many low-income Black women (165). Because this population subgroup is more likely to experience obesity²⁰ than White women, obesity-related diseases, such as hypertension, heart disease and type 2 diabetes, are more common among these females (13,47,58,148,154,165). In fact, Walker et al. (191) found that obese Black women, aged 45-64 years, are 2.4 times more likely to develop type 2 diabetes than their White counterparts. Race/ethnic differences in lifestyle behaviors and economic disadvantage may account for some of the race disparity in the aforementioned obesity-related diseases and their outcomes (148,192).

Overweight and obesity and their associated health problems have a significant economic impact on the U.S. health care system (193-194). Medical costs associated with these conditions accounted for 10 percent of total U.S. medical expenditures in 2000 and may have reached as high as \$117 billion dollars²¹ (183-184). This figure includes both direct and indirect costs²², which claimed \$61 and \$56 billion, respectively (185). Considering the excessive cost required to treat overweight and obesity, it behooves nutrition educators and policy makers to prevent these conditions from occurring.

²⁰ In addition to a higher rate of obesity, Black women are more likely to have an upper body distribution of adipose tissue, which places them at even greater risk for morbidity and early mortality (154).

²¹ Approximately half of these costs were paid by Medicaid and Medicare (193).

²² The former category comprises preventative, diagnostic, and treatment services related to obesity, such as income lost from decreased productivity, sick days, absenteeism, and restricted activity (193). Indirect expenditures include the value of future income lost by premature death (193).

Youth

There is an immediate need for youth in the United States to achieve adequate eating and physical activity patterns (20). The Surgeon General's report indicates the share of children who were overweight nearly doubled from the late 1970s (7 percent) to 1999 (13 percent), and the share of adolescents who were overweight almost tripled (from 5 to 14 percent) in the same period (185). This is alarming, bearing in mind that studies show a positive association²³ between childhood overweight and adult obesity (166). Ferraro et al. (166) found that more than 14 percent of overweight children become severely obese as adults, but less than 4 percent of normal weight children become severely obese. Excess weight acquired during youth may track into adulthood and be associated with an increased risk of cardiovascular disease, hypertension, diabetes, certain types of cancer, and premature death, thus illustrating the need for youth nutrition education (62).

The importance of intervention is underscored by the fact that females are typically influenced by their mothers with regard to desirable body weight. Millman (195) inferred from case studies that Blacks tend to associate positive characteristics, such as power and well-being, with heavy women. Normal weight Black females, who have heavier ideal body sizes than White females during childhood and adolescence, are at greater risk than White females of becoming obese during adolescence and adulthood (65). Neumark-Sztainer et al. (196) reported that obesity prevalence rates are considerably higher among Black than White adolescent girls (30 and 22 percent, respectively). Therefore, maternal influence on daughters' body size ideals may have

²³ This association is stronger for females than males (166).

hazardous implications for the health, including dietary choice and activity, of Black girls as they become adults (65).

A recent survey of Blacks suggested that the high-risk, high-fat eating patterns that contribute to the high prevalence of obesity-related medical hazards during adulthood are established in childhood (63,65,166). Rolls et al. (197) found that as early as the age of 5 years, individuals are stimulated to eat more by the presence of larger portion sizes. Schools further propagate this problem because, oftentimes, the cash-strapped institutions that many overweight children attend are more likely than others to strike franchise deals with snack food and beverage makers (198). With the emphasis placed on nutrient-poor choices, children are predisposed to track unhealthy diets into adolescence. In fact, research has shown adolescents to have low mean intakes of healthy foods (63). Stanton et al. (63) reported that the diets of adolescents in the United States often fail to meet current dietary recommendations and tend to leave adolescents vulnerable to poor diets that are low in disease-preventing foods, such as fruits and vegetables.

Limited activity is also positively associated with overweight and obesity (166). Since low-income youth may not have access to safe outdoor conditions or exercise facilities, they often suffer from higher rates of overweight and obesity. After school, working parents would rather their children stay inside watching television than playing outside in unsafe streets (198). As overweight youth are more likely than healthy-weight youth to become overweight adults, the continual increase in adult obesity rates is likely unless intervention efforts succeed in reducing the incidence of overweight in youth (185).

Stigmatization and Body Image—

Teasing

Unlike racial prejudice, society freely expresses negative attitudes toward overweight and obese people, justifying these opinions on the grounds that weight is controllable (170,199,200). Thus, the overweight and obese may be more likely than other minority groups to encounter overt hostility, discrimination, and limited social and economic success (62,170,186,190). Indeed, these individuals, especially the obese, experience job discrimination, social exclusion, exploitation by the diet and fitness industry, denial of health benefits, trouble finding clothing, mistreatment by doctors, and public ridicule (170,201-203). In a study of overweight adolescent girls (26 White and 24 Black), Neumark-Sztainer et al. (204) found that 96 percent of the girls reported experiences of weight-related stigmatization, including direct and indirect weight-related comments²⁴, differential treatment, and rejection owing to their overweight status. This type of stigmatizing experience consequently predicts negative body image in these overweight adolescent girls (170,205).

Ironically, the obese are just as likely as the non-obese to hold prejudiced attitudes toward and contribute to the mistreatment of other obese individuals (170,200). This appears to reflect a “pecking order” that exists among the obese. It has been widely reported that the more deviant an individual’s body size, the more stigmatization occurrences that individual would be expected to suffer (170). Nonetheless, beyond a cut-off weight indicative of severe obesity, weight and stigmatization are not strongly related (170). Although the prevalence of psychopathology is no greater in obese than

²⁴ Common descriptions include “lazy”, “ugly”, “stupid”, “lacking willpower”, “incompetent”, and “indulgent” (199).

non-obese samples (206), obesity stigmatization is a challenging experience that spoils quality of life, triggers psychological distress, and requires substantial coping efforts (170).

The Perception of Teasing Scale (POTS)

There exist several body dissatisfaction and teasing scales; however, the Perception of Teasing Scale (POTS) has been the assessment tool of choice for many researchers since its inception in 1995. The POTS (Appendix D) is an 11-item scale that assesses perception of teasing based on two subscales—general weight and competency teasing (207). It was developed by Thompson et al. (208) at the University of South Florida in response to research exposing several limitations²⁵ in the Physical Appearance Related Teasing Scale (PARTS), which had been previously used to evaluate body dissatisfaction and eating disturbance. The eventuation of the POTS, which is standardized on a sample of 227 undergraduate females (ages 17-42), required three studies to ensure its validity and reliability. The final study found an internal consistency (Cronbach's alpha) of .94 for the Weight-Related Teasing scale and an alpha of .78 for the Competency Teasing scale (207).

A major advantage of the POTS over the original teasing measure (PARTS) is the inclusion of both a nonweight-teasing subscale (competency) and a subsequent standardization of the specified source of the teasing (208). This allows researchers to assess the differential contributions of weight and competency teasing (208). However, an obvious setback is the scale's retrospective nature, which requires an historical recall

²⁵ These limitations include: (1) lack of specificity regarding body size (*e.g.*, large or small), (2) unsystematic variation with regard to the source of teasing (*e.g.*, parents, siblings, peers), (3) sole focus on appearance-related teasing, leaving open the possibility that observed effects could conceivably be due to subjects' recall of global teasing experiences, (4) oversight in the inclusion of a teasing effect assessment (208).

of events (208). This is problematic because there are several mediating factors, such as selective memory and past or present distress, which can affect the veracity of a subject's judgment of teasing.

Body Image Assessment

In recent years, it has become apparent that body image is crucial in understanding the etiology and treatment of both eating disorders and obesity (209). This psychological construct is multidimensional and includes perceptual, attitudinal, and behavioral components (209). When measuring the perceptual dimension of body experience, one might utilize the moveable caliper technique, image marking procedure, distorted image methodology, or body image silhouette scale (210). These instruments are designed to gauge perceived current body shape and size and may also be used to discern the desired shape and size preferred by respondents (186). However, the most popular tools in assessing the discrepancy between idealized and perceived body sizes are sets of contour and silhouette figures of incremental sizes (211).

Stunkard's standard silhouettes (Appendix E) are commonly used in body image research. Their administration requires respondents to choose the silhouette that most closely resembles how they usually look, as well as the silhouette that represents how they would like to look (212-213). This results in three measures: current size, desired size, and a discrepancy score²⁶ (current – desired), which has been interpreted as a measure of body dissatisfaction (212).

The Stunkard scale appears to be highly robust; to be significantly and highly correlated with measured percentage overweight ($r=.79$); and to be a reliable predictor of

²⁶ Values approaching zero reflect less discrepancy (*i.e.*, the respondent chose the same figure to present their current size and their ideal size) (212).

obesity both alone and in combination with self-recounted height and weight (212). In addition, Thompson and Altabe (214) report moderate to high 2-week test-retest reliability for psychometric characteristics for both men and women. Unfortunately, these silhouettes have a key disadvantage in that they depict only White males and females. Flynn and Fitzgibbon (65) hypothesized that their sample of Black girls and their mothers would have answered questions differently if the drawings had, instead, depicted Black girls. Patel and Gray (211) somewhat circumvented this problem by removing the necks and heads of the male and female figures in order to make them appear less White. However, minute differences still remain in the body shapes and fat distributions of the figures, making it possible to identify the silhouettes as White. Future research needs to focus on developing pictorial body image scales specifically for Black body types to truly obtain an accurate picture of their body image discrepancies (211).

Body Image in Blacks

Despite the magnitude of obesity, some data indicate that Black women are more often satisfied with their weights than are White women, even at higher weights (70,153-154,165,215-219). They may develop a strong positive self-valuation and an alternative beauty aesthetic to resist societal stigmatization (219). Consequently, Black women are likely to underestimate their body size and to believe a larger size is more attractive²⁷ (221). In a study by Mossavar-Rahmani et al. (221), Blacks and Afro-Caribbeans selected 28 percent above ideal body weight (IBW) as attractive to mates versus 13 percent or less for other ethnic groups. This is in agreement with preferences of Black males, whose ideal female silhouettes are always larger than those selected by White

²⁷ Olby (220) reported that Black college undergraduates judge shapely normal weight figures more favorably than subjects of other ethnicities.

males (222). Furthermore, Kumanyika et al. (223) reported that approximately 40 percent of overweight Black women consider their figures attractive or very attractive.

Studies have found that ethnicity may not be the differentiating factor between Blacks and Whites with regard to body image ideals. Rather, factors associated with ethnicity, such as acculturation level, self-esteem, and SES, function as the true risk or protective factors, yet they are masked in various measurements by ethnicity (153,156, 188,215, 221,224). Moreover, Kumanyika and Ewart (58) hypothesize that positive beliefs about obesity occur among populations with a cultural legacy of food shortages and wasting diseases. A Black female who grew up in a family where poverty and hunger were realities is unlikely to view self-deprivation as admirable and may have been taught to comfort herself with food (225). Thus, she may be more predisposed to binge-eating and overweight or obesity.

Self-Esteem in Black Women

Despite the tendency of Black women to be more self-accepting, several studies have shown that those who are overweight are often dissatisfied (156,165,223,226-227). Research by Baturka et al. (165) found that a majority of rural Black female respondents initially expressed some degree of displeasure with their weight or body size. Eleven (92 percent) of twelve obese women desired to lose weight versus six (50 percent) of twelve overweight and normal women (165). However, it appears that two mediating factors—male support and age—exist, which aid in improving self-esteem.

Researchers report a Black male preference for heavy women. One woman (5'1", 275 pounds), in the study by Baturka et al. (165), said that she used to feel very unattractive, but since she acquired a boyfriend, she felt more attractive to other men who

“don’t care how big [she is].” Another woman said her boyfriend did not like “bony women,” and a third liked her weight because her boyfriend said that there was “more for him to hold onto” (165). Because Black men prefer larger women than White men, Black females may be protected from experiencing similar levels of body dissatisfaction as their White counterparts (211).

Regardless of male influence, self-esteem improves with age for both Black and White females (153,173,228). This age-mediated acceptance may be a reflection of these females’ lifelong battles with overweight and nonproductive experiences with dieting to lose weight (186). Furthermore, older Black women may be less influenced by the dominant culture and, hence, may be less prone to show a significant relationship between BMI and self-esteem (153). Thus, older age may enhance self-esteem across all races and ethnicities.

CHAPTER 3

SUBJECTS AND METHODS²⁸

Subject Overview

Fifty adult Black female food stamp recipients, aged 19 to 75 years, were contacted and interviewed at their homes or in social services offices located in East Baton Rouge, West Baton Rouge, Iberville, Iberia, St. Mary, Assumption, and Orleans Parishes. Information was collected from individuals living in both metropolitan and rural areas.

Subject Recruitment

Separate lists of food stamp recipients in East Baton Rouge, Iberville, and Assumption Parishes were obtained, and twenty-five participants were selected randomly from each of the three lists. Only nine positive responses (six from East Baton Rouge, three from Iberville, and zero from Assumption) were generated from telephone calls to the seventy-five selected study participants.

Because this method was cumbersome and unsuccessful in recruiting participants, other methods were employed:

1. Expanded Food and Nutrition Education Program (EFNEP) – trainers and extension agents in East Baton Rouge, Iberville, Assumption, and Orleans Parishes recruited EFNEP participants
2. Word-of-mouth (*i.e.*, snow-ball) promotion – participants recruited additional respondents, including a few in West Baton Rouge Parish

²⁸ All information regarding Subjects and Methods was extracted from a Southern Rural Development Center (SRDC) grant proposal written by Drs. Pamela A. Monroe and Carol E. O'Neil.

3. Flier postings in the Office of Family Support in St. Mary Parish – this method resulted in a number of interested volunteers, who recruited acquaintances from St. Mary and Iberia Parishes
4. Flier postings in a children’s hospital waiting room and in two churches in the New Orleans area – this approach yielded participants from Orleans Parish

Minimal recruiting in St. Tammany Parish netted a single interview.

Data Collection

Several methods of data collection were used. The first was in-depth, semi-structured, audio tape-recorded interviews, which were conducted by the researchers in locations convenient to the participants. The interviews utilized protocols from previous studies by Monroe and O’Neil, with the addition of the Perception of Teasing Scale (POTS) (208).

The research instruments, summarized as follows, included a variety of components for thorough assessment of study participants. These instruments are only a small part of a larger study headed by Monroe and O’Neil.

1. Demographic variables: age, education, marital status, employment, household income
2. USDA Food Security Module Short Form (modified, see Appendix B) – an assessment of the availability and access to food within the last 30 days (121)
3. Tanita scale measurements of weight and body fat; taken in triplicate

4. Waist circumference (WC) – a measurement obtained at the most narrow area below the rib cage and above the umbilicus as viewed from the front (133); taken in triplicate
5. Self-reported height
6. Health status of the participant, including self-reports (*i.e.*, ratings of poor, fair, good, or excellent) of physical and mental health; access to health care and health insurance; frequency of visits to health care providers; and family health history
7. Perception of Teasing Scale (POTS) (208)
8. Stunkard Silhouettes – a pictorial representation of silhouette figures for use in assessing the discrepancy between idealized and perceived body sizes (211)

Data Analysis and Reporting

Data were analyzed, and graphical interpretations were generated by Microsoft Excel. Two-tailed t-tests assuming equal variances were conducted on the data.

Statistical significance was denoted by a p-value ≤ 0.05 .

Data are presented in the Results and Discussion section as mean values plus or minus (\pm) the standard deviation.

Study Approval

This study was approved by the Institutional Review Board of the Louisiana State University Agricultural Center (Appendix F). Any presentations or publications resulting from this work will use summary data or data stripped of individual identifiers in order to guarantee participant confidentiality. Files are secured and available only to the grant investigators.

CHAPTER 4

RESULTS AND DISCUSSION

Participant Characteristics

In a convenience sample of Black female food stamp recipients (aged 19 to 75 years) from Southeast Louisiana, 24 women (48%) were food secure (FS); 20 (40%) were food insecure (FIS); and 6 (12%) were food insecure with hunger (FISH). The proportions of FIS and FISH in the sample were higher than the national averages of 11.1% and 3.5%, respectively. These higher percentages may have arisen from the small sample size or methods by which the sample was obtained for the current study. Since the participants were largely recruited by word-of-mouth, the potential for an under- or overrepresentation of a group is likely. Individuals with similar social, cultural, and economic backgrounds are apt to socialize with one another; thus, if a sample is obtained through word-of-mouth promotion, disproportionate groups are likely to result.

Tables 5 and 6 correspondingly give participant demographic characteristics and medical insurance sources.

Table 5. Demographic characteristics of study participants

Characteristic	FS (n=24)	FIS (n=20)	FISH (n=6)
Age (years)	48.3	43.4	32.4
Weight (lbs.)	212.5	208.2	188.7
Body fat (%)	42.6	44.3	41.2
WC (in.)	40.9	42.1	42.6
BMI (kg/m ²)	35.8	35.9	31.3
Employment			
Part-time (PT)	8%	5%	0%
Full-time (FT)	13%	25%	20%
None	79%	70%	80%
Medical Insurance			
Yes	63%	55%	80%
No	37%	45%	20%

Table 6. Medical insurance sources for the FS, FIS, and FISH

Source	FS	FIS	FISH
Medicaid ²⁹	53%	73%	75%
Medicare	27%	9%	0%
Employment	7%	9%	0%
Other	13%	9%	25%

Food Secure

The FS had the highest³⁰ average age (48.3 years, standard deviation [SD]=14.4 years) and weight (212.5 lbs., SD=77.7 lbs.), but the lowest WC (40.9 in., SD=8.0 in.). Average body fat was 42.6%, and BMI was 35.8 kg/m² (SD=12.9 kg/m²). Although the total proportion of unemployed FS participants fell between the unemployment proportions of the FIS and the FISH, the FS had the highest percentage of part-time employment (8%) and the lowest percentage of full-time employment (13%). Thirty-seven percent of FS participants claimed to have no medical insurance. Of the 63% who did have medical insurance, 53% and 27% were insured by Medicaid and Medicare, respectively. The FS in the study had the lowest proportion of individuals with public health care plan coverage. This is most likely reflective of the rigid Medicare and Medicaid eligibility requirements, which are aimed at controlling health care costs but unfortunately, succeed at excluding many of the needy.

Food Insecure

FIS participants were 43.4 years (SD=13.2 years) and had an average WC of 42.1 in. (SD=9.5 in.) They weighed 208.2 lbs. (SD=65.2 lbs.) and had a percent body fat (44.3%) and BMI (35.9 kg/m², SD= 11.4 kg/m²) that were only slightly higher than those

²⁹ According to the Louisiana Department of Health and Hospitals, 59.3%, 22.3%, and 18.4% of Louisiana citizens were non-Medicaid insured, Medicaid insured, or uninsured, respectively (231).

³⁰ All results were numerically, not significantly, different.

of both the FS and FISH. The FIS individuals experienced the least unemployment (70%) of all groups yet were also least likely to have medical insurance (45%). Seventy-three percent of the medically insured were covered by Medicaid, while the remaining 27% were equally divided among Medicare, employment, and other insurance.

Food Insecure with Hunger

The average age (32.4 years, SD=13.7 years), weight (188.7 lbs., SD=49.3 lbs.), percent body fat (41.2%), and BMI (31.3 kg/m², SD=5.6 kg/m²) of the FISH participants were the lowest of the three groups. However, the WC of this group (42.6 in., SD=14.6 in.) exceeded that of the FS and FIS. Eighty percent of the FISH were not employed yet the same proportion was insured medically. Medicaid provided the majority (75%) of medical coverage, while 25% of the participants were insured through other means.

Weight

Figures 9-12 show the relative distribution of weight classification by BMI for the FS, FIS, and FISH participants. As evidenced by these graphs, the FS had the highest proportion of underweight (9%) and class II obese (13%) individuals. Normal weight (19%) and class III obesity (33%) were more prevalent in the FIS cohort, while the FISH had the highest incidence of overweight (50%) and obesity class I (33%). Because BMI does not distinguish between fat and muscle mass (133), participant body fat was evaluated. The results, observed in Figure 13, most likely confirm that BMI correctly classified these individuals because the majority had body fat percentages in the “obese” range. Bioelectrical impedance, which the Tanita scale measures, assumes that subjects are normally hydrated (132). An overestimation of fat mass will result if a subject is dehydrated, which can arise from insufficient water intake, excessive perspiration, or caffeine, alcohol, or other diuretic use (132). Moderate dehydration would not be

uncommon in the sample of FS, FIS, and FISH participants since a preliminary analysis of the 24-hour dietary recalls revealed a low intake of water among the aforementioned groups.

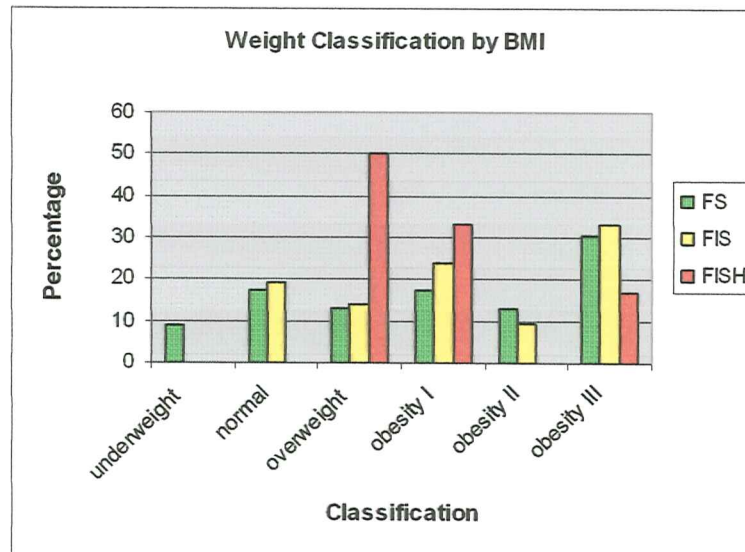


Figure 9. Weight classification by BMI

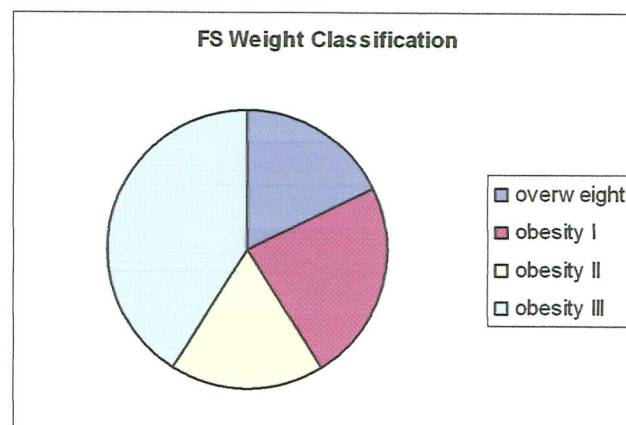


Figure 10. FS weight classification by BMI

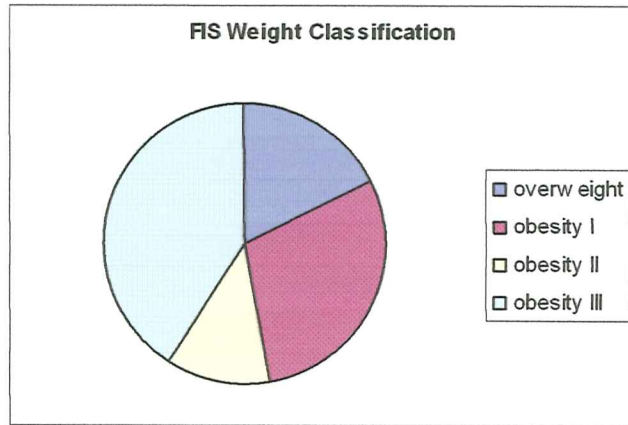


Figure 11. FIS weight classification by BMI

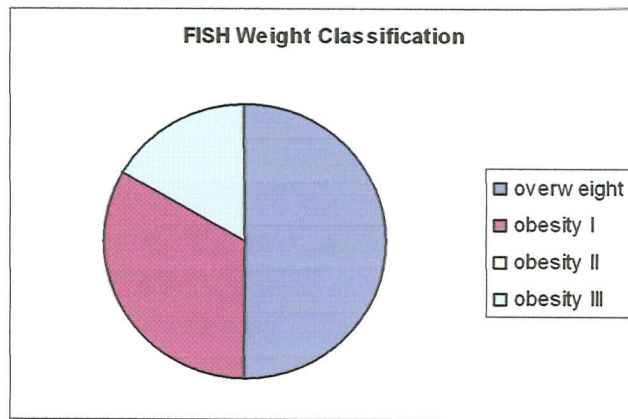


Figure 12. FISH weight classification by BMI

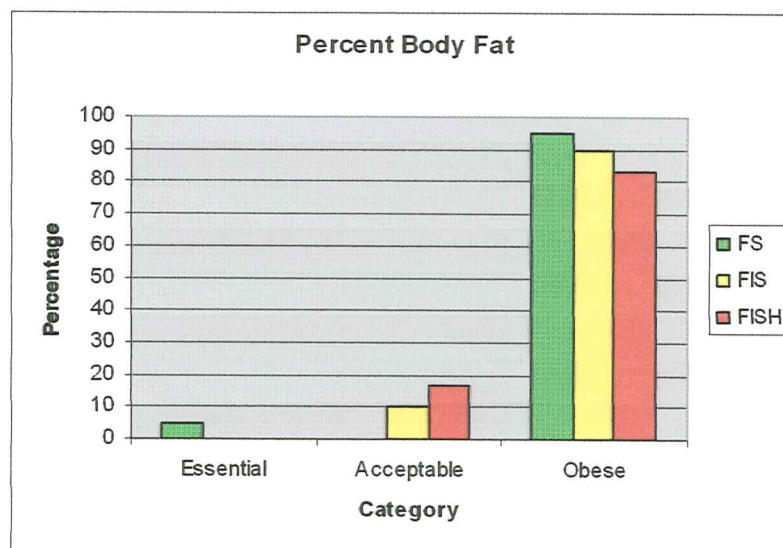


Figure 13. Percent body fat

The results of this study do not differ significantly from the literature, which has reported high rates of obesity among Black women (13,47,58,65,128,148-149,153-155,165,191). Black females typically have a lower income and are more likely to be food insecure than White males and females (8,161). In fact, non-Hispanic Black and Hispanic households are three times as likely to be food insecure as non-Hispanic White households (12). It has been suggested that their poor economic condition has contributed to the promulgation of obesity among Black women (4,10,12,91,171-172). Moreover, the food insecure, regardless of race, often face the privations associated with the monthly food acquisition cycle (4,10,91,171-176,179), which may cause weight gain by directly affecting food availability and dietary choices (4,65,230) or indirectly creating stress, which affects an individual's biochemistry (20,91,234-238). Stress has been shown to activate the hypothalamic-pituitary-adrenal axis, which may produce the hormonal modifications associated with obesity (238). Moreover, the food cycle may limit the variety of foods available and result in the consumption of high-energy, low-cost foods when resources are available (4). However, when resources have been exhausted, those experiencing the food acquisition cycle are likely to skip meals or utilize coping mechanisms (*e.g.*, borrowing money for food, selling personal belonging, stealing) that fall outside the social norm (4,174). Once this period of deprivation ends, individuals tend to overconsume foods, which may, over time, result in obesity (4).

Even though *moderate overweight* may provide protective health effects (*e.g.*, reduced risk of hip fractures) for women during advanced middle age and later life (166), obesity significantly increases morbidity and mortality. Some of the health risks associated with obesity include certain types of cancer (*e.g.*, endometrial, colon, uterine, cervical, postmenopausal breast) (165,173,182-186), stroke (152,182-84), and congestive

heart failure (153,182). Research by Olson (171) reported a 25% increase in the risk of death among food insecure female participants reporting a mean difference of two BMI units. With the substantial increase in obesity observed in the U.S. population, the approximate 300,000 annual deaths attributed to obesity will probably rise unless an aggressive intervention is undertaken (128,166,180).

Because severe obesity is more likely among persons with limited education³¹ and income (6,166,170), it may not be surprising³² that the FIS had the highest rates of class III obesity. However, this observation does not explain why the FS had a higher rate (30%) of severe obesity than the FISH (17%). Some researchers have postulated that the decrease in all classes of obesity—not just severe—in the FISH occurs secondary to the lower food intakes of this group (4,14). Tarasuk and Beaton (83) found significantly lower mean intakes of energy, protein, vitamin A, iron, magnesium, and zinc among women in food insecure households reporting hunger than in food insecure households where no hunger was present. In order to determine whether the differences were due to lower food intakes or differing food selection patterns, Tarasuk and Beaton analyzed nutrient intake per MJ and found no significant differences in macro- or micronutrient intake, except for vitamin A. From this finding, they suggested that the differences in macro- and micronutrient intakes initially observed were due primarily to lower food intakes among their sample of FISH females. In another study, Tarasuk (14) reported that women in FIS households had higher group mean intakes of grain, dairy, vegetable, and meat products than women living in FISH households. In fact, FISH mean intakes of

³¹ Olson and Rauschenbach (6) found that education was the only social, demographic, or economic factor associated with food supplies in their study of women living in rural upstate New York. Women with more education had significantly larger food inventories.

³² The data needs to be further analyzed to determine the degree to which the FIS are low income or have limited education.

food products fell further below Canadian Food Guide recommendations when compared to FIS average food product intakes.

Perception of Body Size

Table 7 and Figures 14-16 illustrate the perception of body size by the FS, FIS, and FISH participants. The FIS had the highest total body size underestimation (-9.3 kg/m²) followed by the FS (-7 kg/m²) and FISH (-3 kg/m²), respectively. The FS participants also had a slightly higher desired BMI (23 kg/m²) than the FISH (22.5 kg/m²) and the FIS (22.1 kg/m²). Interestingly, the obese FS participants were the least likely (43%) to correctly identify³³ their body size on the Stunkard scale. However, 64% of the obese FIS appropriately categorized themselves, while 67% of obese FISH succeeded at the same task. Approximately 65% of combined obese FIS and FISH correctly identified their body size.

It was not surprising to find an underestimation of body size across all groups in this study since research has shown that Black women are prone to underrating their body size (13,65,153,221). However, it was hypothesized that the FISH would have the highest total body size underestimation because it has been reported that as income levels decrease, the proportion of Black women who perceive themselves as overweight also decreases (165). Thus, a complex interaction among several demographic and socioeconomic factors must exist as an explanation for this anomaly.

³³ within 10 kg/m² of their actual BMI

Table 7. Perception of body size by the FS, FIS, and FISH

	FS	FIS	FISH
Actual BMI (kg/m ²)	35.1	36.6	31.3
Perceived BMI (kg/m ²)	28.1	27.3	28.3
Difference between Actual and Perceived BMI (kg/m ²)	-7	-9.3	-3
Desired BMI (kg/m ²)	23	22.1	22.5

Furthermore, the FS, FIS, and FISH participants chose relatively thin, but nonetheless “normal,” ideal figures. Some studies have shown that low-income Blacks are typically more tolerant of higher BMIs and do not perceive overweight as unhealthy or unattractive (58,63,65,154). However, more recent research³⁴ has shown that overweight females, as gauged by silhouettes, are rated as least physically attractive and emotionally stable, while shapely normal weight women are rated favorably with respect to personality traits and overall health (188,220). Further research should be conducted to determine if Black women have begun adopting a different body size value system in light of the increase in obesity-related morbidity and mortality.

It would benefit low-income Black women to shift their body size preferences to normal weight figures since obesity has been associated with an increased risk of morbidity and mortality (192,230). By adopting and propagating the acceptance of normal weights, these women would, in effect, decrease their risk of obesity-related illnesses. However, the implementation of a new body size standard must be approached carefully, while also maintaining cultural sensitivity, so as not to trigger eating disorders or offend the traditions of the Black culture.

³⁴ One study looks at a population of college undergraduates—an overall younger population than that in our study.

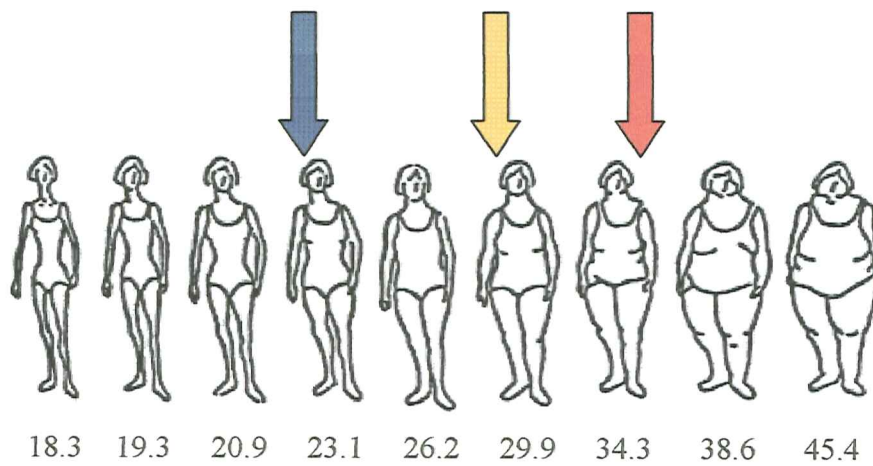


Figure 14. Perception of body size by the FS³⁵

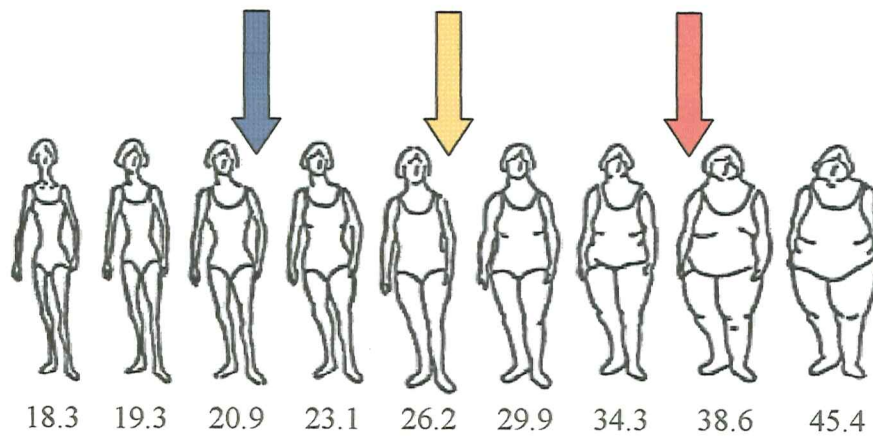


Figure 15. Perception of body size by the FIS

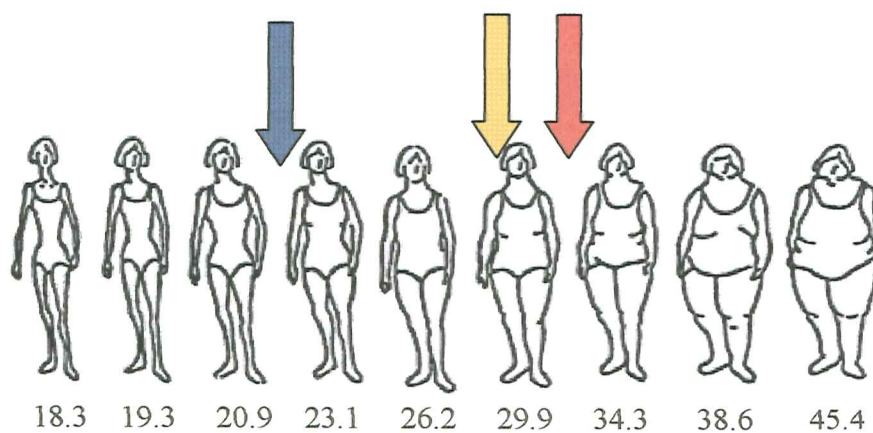


Figure 16. Perception of body size by the FISH

³⁵ Red stands for actual weight; yellow stands for perceived weight; blue stands for desired

Self-Rated Physical Health (PH)

Not surprisingly, food insecurity affects PH. Figures 17-31 (see also Appendix G) illustrate comparisons of self-rated PH over 5 years and at present among the FS, FIS, and FISH.

FS participants generally perceived their current PH to be “good” (46%) followed by “fair” (38%) and “excellent”/“poor” (8% each) (Figures 17-19). “Good” PH was also experienced over the past 5 years by the FS (38%) yet an additional 38% selected “fair” to describe their PH during this same time period. The fewest number of FS participants (4%) assessed their PH over the past 5 years as “poor.” Thus, the relative trend characterized by the FS in this study was to choose more favorable PH ratings. This distribution was expected because, according to the literature, FS individuals should experience somewhat better PH than their FIS and FISH counterparts, as food insecurity has been linked to poor health (4,12,14,171,174-175). However, since the FS were on food stamps and have likely endured the monthly food acquisition cycle, it was not unanticipated that “fair” and “poor” were also chosen to describe both current PH and that over the past 5 years (4,10,14,38,91). If food stamp recipients typically choose low cost, nutrient-deficient foods, as opposed to fruits and vegetables, to sustain their families (4,53,93,108), these individuals would lack key antioxidant and anticarcinogenic compounds, which may protect them from disease. For example, Tibbs et al. (61) found that a high consumption of fat and total energy, paired with low consumption of fruits and vegetables, increases the risk for cancer and other chronic diseases.

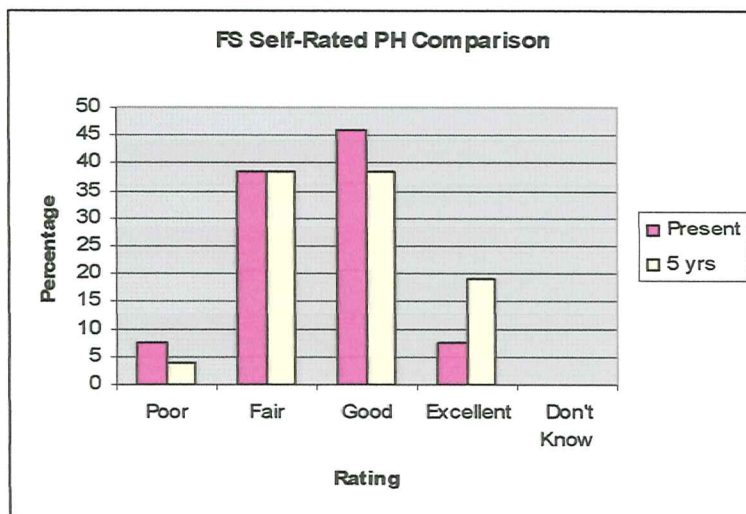


Figure 17. Comparison of FS self-rated PH at present and over the past 5 years

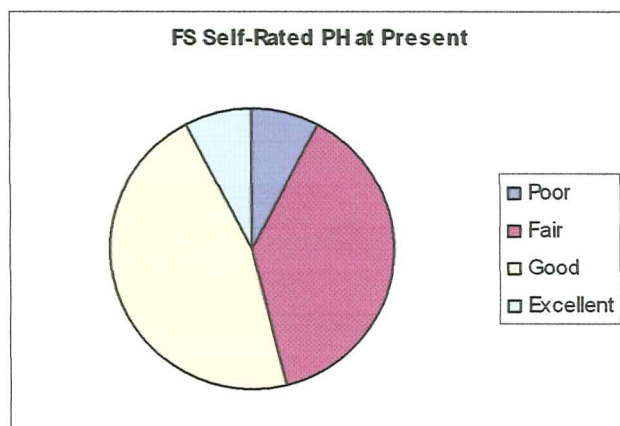


Figure 18. FS present self-rated PH

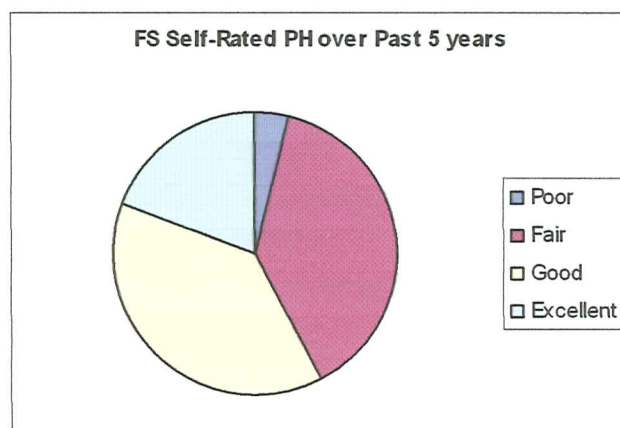


Figure 19. FS self-rated PH over the past 5 years

The FIS had a more negative view regarding their current and past PH status (Figures 20-22). Forty-three percent of the participants claimed to have suffered from “poor” PH over the past 5 years, while the status currently experienced by the majority of the FIS was “fair” (57%). Only 5% of the FIS in this study described both their past and present PH as “excellent.”

This poorer self-rated PH is reflective of the actual “poor” PH experienced by most FIS individuals, particularly Black females. Although diet-related chronic disease is experienced by most FIS individuals (4,12,14,83,229), minority women in this group are at greater health risk because they suffer from higher rates of the aforementioned maladies and have shorter life expectancies than the general populace (14). It has been postulated that this health disparity arises, in part, from the higher poverty rate, lack of education, and limited access to health care observed in the community of FIS females (8,17,35,58,171). Analysis of data from the U.S. Survey of Income and Program Participation illustrated that FIS households had lower average incomes, were more likely to have lost food stamp benefits, and were less able to endure these losses with savings and loans than FS households (232). Cristofar and Basiotis (233) found that household food insecurity is also associated with poor self-rated health among low-income women with children. From this study and her own, Tarasuk (14) suggested that chronic and severe FIS predisposes individuals to poor health.

In addition, Black women are more likely to experience obesity and obesity-related diseases (13,47,58,65,128,148-149,153-155,165,191). These illnesses reduce an individual’s quality of life, which may be reflected in the FIS participant responses. It appears that the combination of food insecurity and obesity, which were both observed in the FIS participants, might lead to poorer self-ratings of PH.

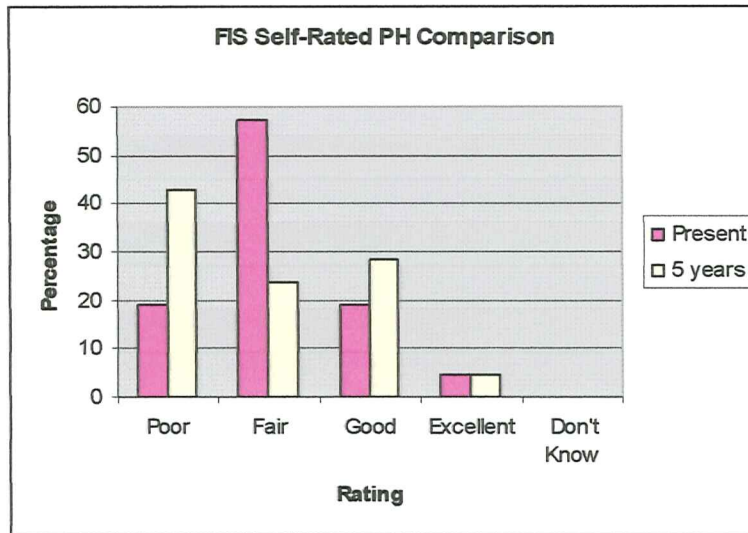


Figure 20. Comparison of FIS self-rated PH at present and over the past 5 years

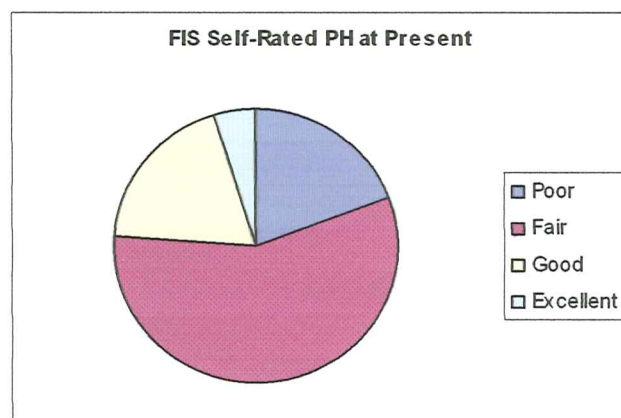


Figure 21. FIS present self-rated PH

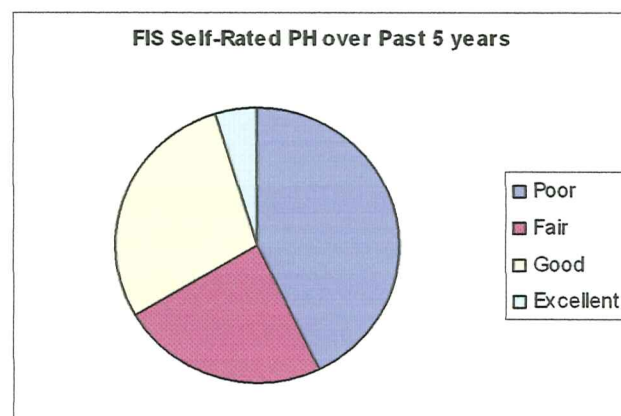


Figure 22. FIS self-rated PH over the past 5 years

As evidenced in Figures 23-25, the FISH predominantly regarded their PH over the past 5 years in a more negative manner than they did their current PH. The participants chose “poor” (20%) when only describing their past PH, while they selected “excellent” (20%) for only their present day status. A higher percentage of FISH (60%) perceived their PH over the past 5 years as “fair,” as compared to the 40% who deemed their current PH to possess the same rating. Moreover, an additional 40% of the participants perceived their present day PH to be “good.” This general distribution of ratings more closely resembles that of the FS than the FIS, which was somewhat surprising. It was postulated, on the one hand, that the FISH would have poorer actual PH and subsequent poor PH self-assessments based on their food security status (4,175). Conversely, the FISH had the highest prevalence of overweight and may not have experienced the same severity of weight-related illness as the FIS, who had the highest prevalence of class III obesity. Greater degrees of obesity have been associated with poorer PH (137,184,189). However, since the data were obtained through self-rating, these findings may not represent the FISH’s actual PH.

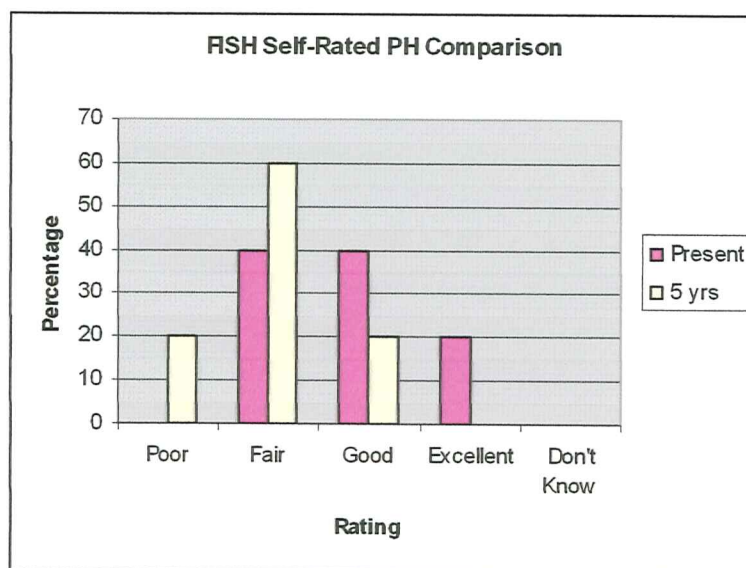


Figure 23. Comparison of FISH self-rated PH at present and over the past 5 years

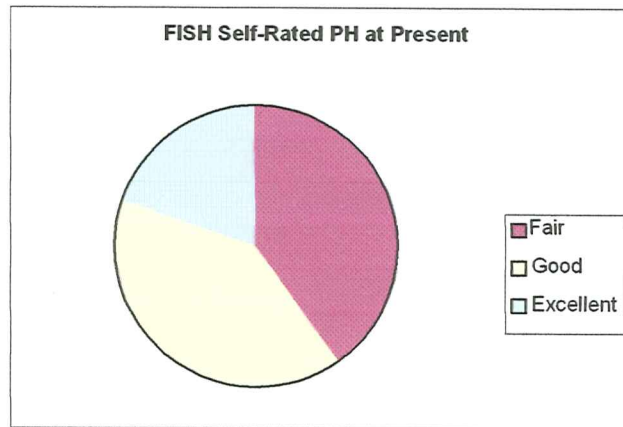


Figure 24. FISH present self-rated PH

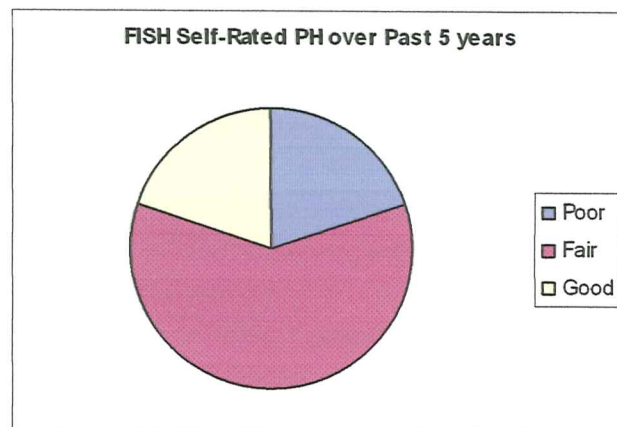


Figure 25. FISH self-rated PH over the past 5 years

Self-Rated Mental Health (MH)

MH was affected by food insecurity but in a less predictable manner than PH. Figures 32-46 (see also Appendix G) show comparisons of both present MH and that over the past 5 years across all three groups (FS, FIS, FISH).

As evidenced in Figures 32-34, the FS participants rated their MH as predominantly “good” for both present day (46%) and the past 5 years (42%). Fewer individuals (4%) said they currently suffer from “poor” MH as compared to those (8%) who had experienced “poor” MH over the past 5 years. “Fair” and “excellent” rankings remained unchanged between the two time periods; 27% and 23% described their MH as “fair” and “excellent,” respectively.

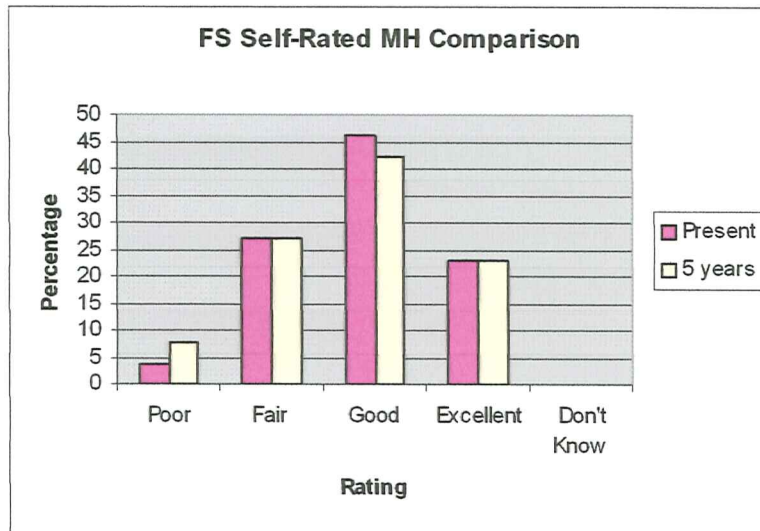


Figure 32. Comparison of FS self-rated MH at present and over the past 5 years

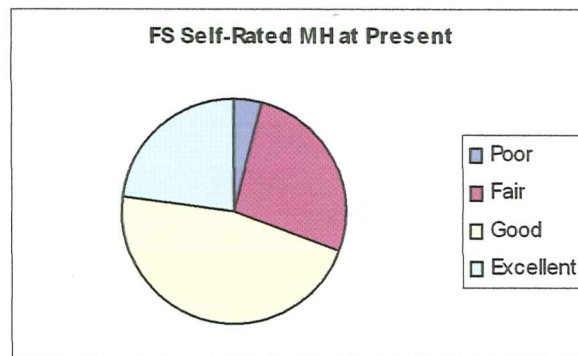


Figure 33. FS present self-rated MH

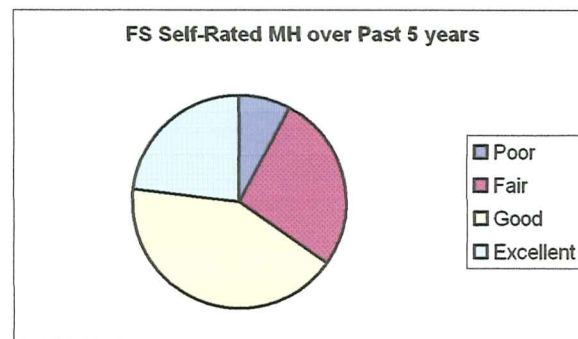


Figure 34. FS self-rated MH over the past 5 years

The FIS reported “good” MH over the past 5 years (43%) followed by “fair” (24%), “excellent” (19%), “poor” (10%), and “don’t know” (5%) (Figures 35-37). The selection of the latter was not surprising since study participants often have difficulty recalling personal, historic information (72,82-83,208). A poor recollection of events

might be further complicated by the fact that, unlike PH, MH may be a more difficult evaluation for the FIS, who, as a majority, are not well-educated and may be receiving substandard medical care (10-11,35,171,229). These individuals might find it easier to remember and comprehend a concrete occurrence, such as a heart attack or cancer, as opposed to a more complex psychological disturbance (*e.g.*, post-traumatic stress disorder or depression).

Top ranking for current FIS MH was evenly divided between “fair” and “good” (33% each). Moreover, a difference between present day and past “poor” MH was detected in this group; 14% and 10% responded with the lowest ranking for their current and past MH, respectively. These increases in present day “fair” and “poor” evaluations may have arisen from weight-related stigmatization and subsequent poorer self-image since the FIS had the highest percentage of individuals exhibiting class III obesity. Hill and Williams (190) found that class III obese women ($BMI \geq 40$) generally express the greatest dissatisfaction with their body weight, shape and appearance and have the lowest self-esteem. Even though Black women, as a group, typically disregard the societal norm in relation to body size preference, some of the participants in the study may have been adversely affected by teasing or other stigmatization experiences based on their body sizes.

Regardless of weight and BMI, the overweight and obese experience psychological distress secondary to encounters with overt hostility and discrimination (62,170,186,190,201-203). This may serve as a plausible explanation for the graphical shift toward poorer current MH status because recent stigmatization experiences would likely resonate with an individual and be much easier to recall. However, past teasing experiences, as measured by the POTS (208), may be an important contributor to poor

MH self-ratings, as body image and self-esteem generally improve with age in Black females (153,173,228).

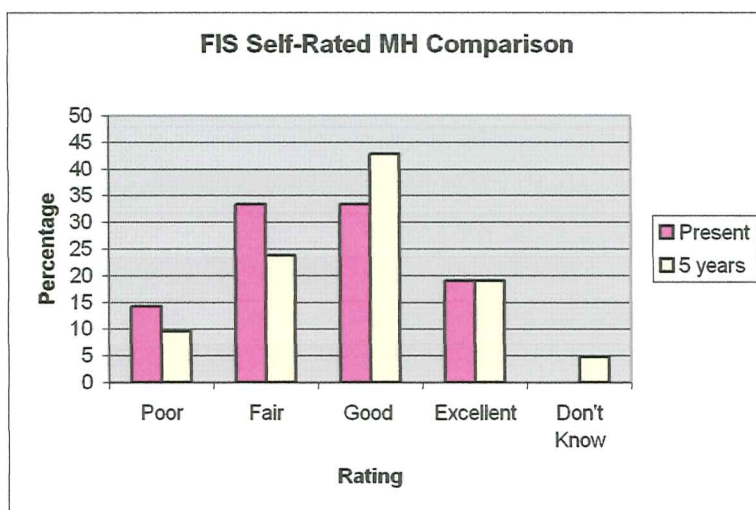


Figure 35. Comparison of FIS self-rated MH at present and over the past 5 years

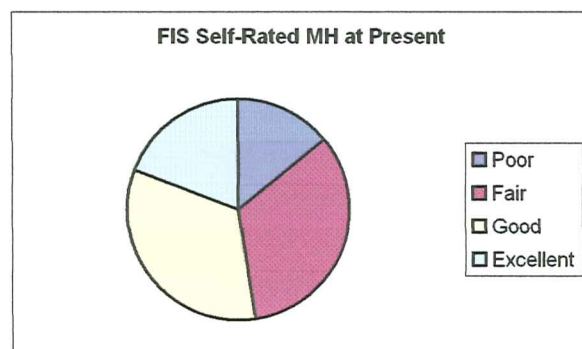


Figure 36. FIS present self-rated MH

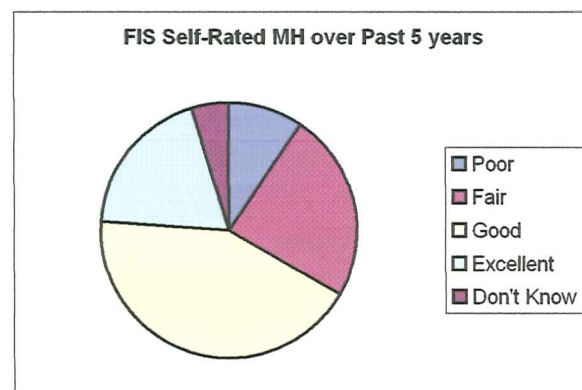


Figure 37. FIS self-rated MH over the past 5 years

Interestingly, the FISH viewed their MH as either “good” or “excellent” (Figures 38-40), which differed from the FS and FIS, whose responses ranged across all categories. FISH self-rated MH over the past 5 years was principally “good” (80%) while that of present day was “excellent” (60%). These findings conflict with some of the published literature, which links depression and psychosocial dysfunction with food insecurity (4,12,14,20,24,41,174). Based on this information, the FISH in the current study should have rated their MH as “poor” or “fair”—certainly, not “good” or “excellent.” However, the results do not temporally categorize the ratings, which is important when taking into account the effects of the monthly food acquisition cycle. Perhaps, the current “excellent” MH reported by the FISH participants would likely change to “poor” or “fair” toward the end of the month, when food stamp recipients have exhausted their resources. In fact, Sarlio-Lahteenkorva and Lahelma (91) found that both voluntary and involuntary food deprivation result in a variety of cognitive and behavioral changes, such as preoccupation with food and eating. This fixation might manifest itself in poorer MH ratings by participants who have not appropriately rationed their food stamps and face the distress of hunger.

Conversely, it can be inferred that the more positive MH reported by the FISH results from an external locus of control. Some scholars have posited that most Blacks (*i.e.*, the race of all 6 FISH participants) maintain an external locus of control that has served to mediate stress and places the failure to achieve good health and “the good life” outside of one’s control (13,52). Therefore, an alleviation of stress or other burdens in one’s life should ultimately, if only slightly, improve MH ratings.

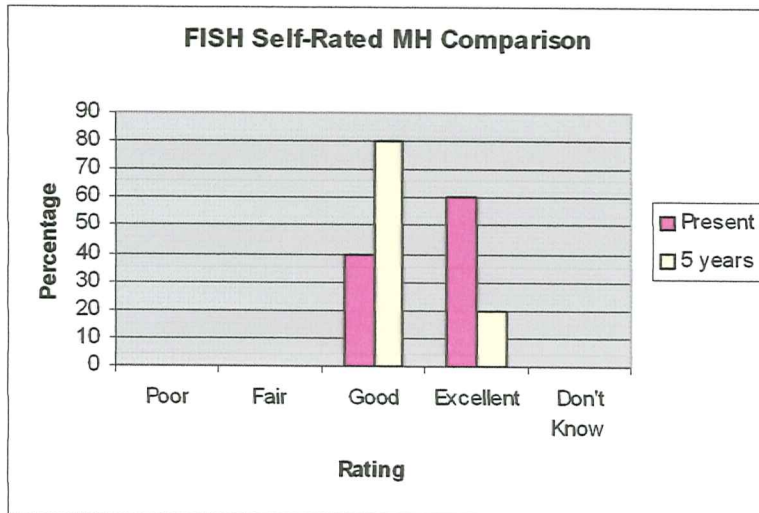


Figure 38. Comparison of FISH self-rated MH at present and over the past 5 years

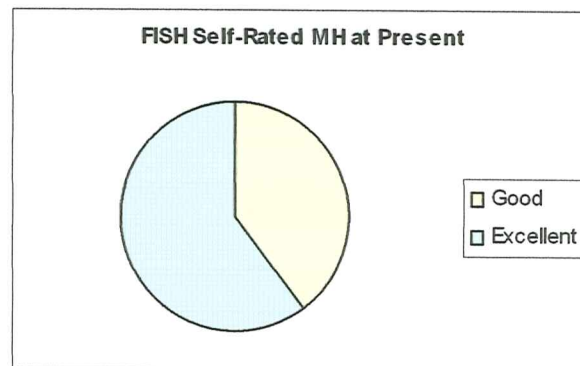


Figure 39. FISH present self-rated MH

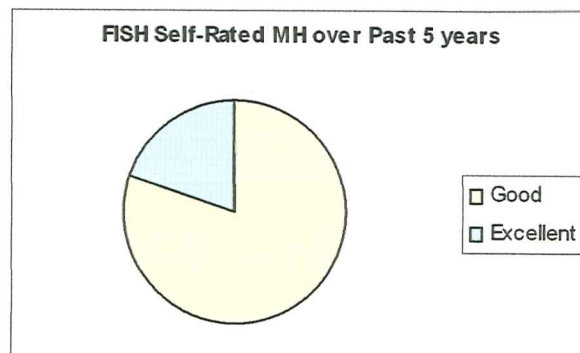


Figure 40. FISH self-rated MH over the past 5 years

CONCLUSIONS AND FUTURE DIRECTIONS

There were no significant differences ($p \leq .05$) found in the data based on the two-tailed t-tests assuming equal variances. However, there were numerical differences, with no consistent or predictable pattern, among the groups. The FS had the highest average age (48.3 years, SD=14.4 years) and weight (212.5 lbs., SD=77.7 lbs.); the FIS had the highest body fat percentage (44.3%) and BMI (35.9 kg/m², SD=11.4 kg/m²); and, the FISH had the highest WC (42.6 in., SD=14.6 in.). The majority of participants in the FS, FIS, and FISH had a body fat percentage rating of “obese;” moreover, the participants in all groups underestimated their actual body size, which is consistent with the literature. The “ideal” body size for the FS, FIS, and FISH fell between 22 and 23 kg/m². Self-rated PH and MH also varied across the three groups yet there were more overall positive MH self-ratings than PH self-ratings.

Since this current study is only a portion of a larger study headed by Drs. Monroe and O’Neil, it should be noted that further data collection and analysis will be undertaken. Additional information (*i.e.*, perception of a healthy meal, self-rated nutrition knowledge, disease history and prevalence, medication usage, and 24-hour dietary recall analysis) will be included in the final research report by Monroe and O’Neil.

Future research should focus on, but not be limited to, the following three areas:

1. Comparison of the types and frequencies of chronic diseases with participant self-rated health measures and medical insurance sources, coverage, and benefits.

2. Investigation of possible childhood stigmatization and its effect on body weight and MH self-ratings in adulthood.
3. Determination of the effect of past maternal behavioral modeling on current participant food choice and “ideal” body size preferences.

LITERATURE CITED

1. Boyle MA, Morris DH. *Community Nutrition in Action: An Entrepreneurial Approach*. Belmont, CA: West/Wadsworth; 1999.
2. Kendall A, Olson CM, Frongillo EA Jr. Relationship of hunger and food insecurity to food availability and consumption. *JADA*. 1996;96(10):1019-24.
3. Life Sciences Research Organization. Core indicators of nutritional status for difficult-to-sample populations. *J Nutr*. 1990;120:1559S-1600S.
4. Adams EJ, Grummer-Strawn L, Chavez G. Food insecurity is associated with increased risk of obesity in California women. *J Nutr*. 2003;133(4):1070-4.
5. Nord M, Andrews M, Winicki J. Frequency and duration of food insecurity and hunger in US households. *J Nutr Educ Behav*. 2002;34(4):194-201.
6. Olson CM, Rauschenbach BS. Factors contributing to household food insecurity in a rural upstate New York county. *Fam Econ Nutr Rev*. 1997;10(2):2-16.
7. State Fact Sheets from USDA/ERS. Available at: www.ers.usda.gov. Accessed November 8, 2003.
8. Nord M, Andrews M, Carlson S. *Household food security in the United States, 2002*. FANRR-35. Food and Rural Economics Division, Economic Research Service. Washington, DC: U.S. Department of Agriculture.
9. Curtis KA, McClellan S. Falling through the safety net: poverty, food assistance and shopping constraints in an American city. *Urb Anthropol*. 1995;24(1-2):93-135.
10. Townsend MS, Peerson J, Love B, Achterberg C, Murphy SP. Food insecurity is positively related to overweight in women. *J Nutr*. 2001;131(6):1738-45.
11. Rose DR, Basiotis PP, Klein BS. Improving federal efforts to assess hunger and food insecurity. *Food Rev*. 1995;18(1):18-23.
12. Cook JT. Clinical implications of household food security: definitions, monitoring and policy. *Nutr Clin Care*. 2002;5(4):152-167.
13. Gates G, McDonald M. Comparison of dietary risk factors for cardiovascular disease in African-American and white women. *JADA*. 1997;97(12):1394-1400.
14. Tarasuk VS. Household food insecurity with hunger is associated with women's food intakes, health and household circumstances. *J Nutr*. 2001;131(10):2670-6.

15. Andrews M, Nord M, Bickel G, Carlson S. *Household Food Security in the United States, 1999*. FANRR-8. Food and Rural Economics Division, Economic Research Service. Alexandria, VA: U.S. Department of Agriculture.
16. Duffy PA, Hallmark GG, Molnar JJ, Claxton L, Bialy C, Miklouchich S. Food security of low-income single parents in East Alabama: use of private and public programs in the age of welfare reform. *Southern Rural Sociol.* 2002;18(1):48-81.
17. Molnar JJ, Duffy PA, Claxton L, Bailey C. Private food assistance in a small metropolitan area: urban resources and rural needs. *J Sociol Social Welfare.* 2001;28(3):187-209.
18. Morris PM, Neuhauser L, Campbell C. Food security in rural America: a study of the availability and costs of food. *J Nutr Educ.* 1992;24(1):52S-58S.
19. Brody G, Flor D. Maternal resources, parenting practices and child competence in rural, single-parent African American families. *Child Develop.* 1998;803-16.
20. Lee EJ, Murry VM, Brody G, Parker V. Maternal resources, parenting and dietary patterns among rural African American children in single-parent families. *Public Health Nursing.* 2002;19(2):104-11.
21. Rural Income, Poverty and Welfare: Rural Poverty. Available at: www.ers.usda.gov/Briefing/incomepovertywelfare/ruralpoverty/. Accessed November 8, 2003.
22. Campbell CC. Food insecurity: a nutritional outcome or a predictor variable? *J Nutr.* 1991;121:408-415.
23. Kendall A, Olson CM, Frongillo EA. Validation of the Radimer/Cornell measures of hunger and food insecurity. *J Nutr.* 1995;125:2793-2801.
24. Hoisington A, Shultz JA, Butkus S. Coping strategies and nutrition education needs among food pantry users. *J Nutr Educ Behav.* 2002;34(6):326-333.
25. Lang T. Dividing up the cake: food as social exclusion. In: Walker A, Walker C, eds. *Britain Divided*. London, UK: CAPAG Ltd.; 1997.
26. Leather S. *The Making of Modern Malnutrition*. London, UK: The Caroline Walker Trust; 1996.
27. Radimer KL, Olson CM, Campbell CC. Development of indicators to assess hunger. *J Nutr.* 1990;120:1544-48.

28. Dowler E, Leather S. Spare some change for a bite to eat? From primary poverty to social exclusion: the role of nutrition and food. In: Bradshaw J, Sainsbury R, eds. *Experiencing Poverty*. Aldershot, Canada: Ashgate; 2000.
29. Shotland J, Loonin D. Patterns of risk: the nutritional status of the rural poor. Washington, D.C.: Public Voice for Food and Health Policy; 1998.
30. Becker K, Rasmussen H. The New Thrifty Food Plan. *Nutr Clin Care*. 2002;5(4):199.
31. Andrews M, Kantor LS, Lino M, Ripplinger D. Using USDA's Thrifty Food Plan to assess food availability and affordability. *Food Rev*. 2001;24(2):45-53.
32. Kaufman P, Lutz SM. Competing forces affect food prices for low-income households. *Food Rev*. 1997;20(2):8-12.
33. Lino M. Income and spending of poor households with children. *Fam Econ Nutr Rev*. 1996;9(1):2-13.
34. Morton JF, Guthrie JF. Diet-related knowledge, attitudes and practices of low-income individuals with children in the household. *Fam Econ Nutr Rev*. 1997;10(1):2-15.
35. Mayo RM, Rainey CJ. What we think they think: health professionals' views of nutritional beliefs and practices of low income older women. *J Nutr Elderly*. 2001;20(4):19-41.
36. Arcury TA, Quandt SA, Bell RA, McDonald J, Vitolins MZ. Barriers to nutritional well-being for rural elders: community experts' perceptions. *The Gerontologist*. 1998;38:490-98.
37. Rank MR, Hirschl TA. The link between population density and welfare participation. *Demography*. 1993;30(4):607-22.
38. Wilde PE, Ranney CK. The monthly food stamp cycle: shopping frequency and food intake decisions in an endogenous switching regression framework. *Amer J Agr Econ*. 2000;82:200-13.
39. Guthrie JF, Lin B. Overview of the diets of lower- and higher-income elderly and their food assistance options. *J Nutr Educ Behav*. 2002;34:31S-41S.
40. Daponte BO, Lewis GH, Sanders S, Taylor L. Food pantry use among low-income households in Allegheny County, Pennsylvania. *J Nutr Educ*. 1998;30(1):57-63.
41. Hilton K. Close down the food banks. *Canadian Dimension*. 1993;27(4):22-23.

42. Thompson RE, Taren DL, Andersen E, Casella G, Lambert JKJ, Campbell CC, Frongillo JEA, Spicer D. Within month variability in use of soup kitchens in New York State. *Am J Pub Health*. 1988;78:1298-1301.
43. Bisogni CA, Connors M, Devine CM, Sobal J. Who we are and how we eat: a qualitative study of identities in food choice. *J Nutr Educ Behav*. 2002;34:128-139.
44. Bouchoux A. Exploring the food and health attitudes of older Americans. *J Nutr Elderly*. 2001;20(3):39-43.
45. Schafer E, Schafer RB, Keith PM, Bose J. Self-esteem and fruit and vegetable intake in women and men. *J Nutr Educ*. 1999;31(3):153-160.
46. Mela DJ. Food choice and intake: the human factor. *Proc Nutr Soc*. 1999;58:513-21.
47. Hargreaves MK, Schlundt DG, Buchowski MS. Contextual factors influencing the eating behaviours of African American women: a focus group investigation. *Ethnicity Health*. 2002;7(3):133-147.
48. Falk L, Bisogni C, Sobal J. Food choice processes of older adults. *J Nutr Educ*. 1996;28:257-65.
49. Furst T, Connors M, Bisogni C, Sobal J, Falk L. Food choice: a conceptual model of the process. *Appetite*. 1996;26:247-65.
50. Devine C, Connors M, Bisogni C, Sobal J. Life course influences on fruit and vegetable trajectories: a qualitative analysis of food choices. *J Nutr Educ*. 1998;31:361-70.
51. Connors M, Bisogni C, Sobal J, Devine C. Managing values in personal food systems. *Appetite*. 2001;36:189-200.
52. Schoenberg NE. A convergence of health beliefs: an "ethnography of adherence" of African American rural elders with hypertension. *Human Organization*. 1997;56(2):174-181.
53. Shankar S, Klassen A. Influences on fruit and vegetable procurement and consumption among urban African-American public housing residents, and potential strategies for intervention. *Fam Econ Nutr Rev*. 2001;13(2):34-46.
54. Bronner Y, Burke C, Joubert BJ. African-American/soul food ways and nutrition counseling. *Topics Clin Nutr*. 1994;9(2):20-7.

55. Byars D. Traditional African American foods and African Americans. *Agric Human Values*. 1996;13(1):74-8.
56. Dirks RT, Duran N. African American dietary patterns at the beginning of the 20th century. *J Nutr*. 2001;131(7):1881-89.
57. Devine CM, Sobal J, Bisogni CA, Connors M. Food choices in three ethnic groups: interactions of ideals, identities, and roles. *J Nutr Educ*. 1999;31(2):86-93.
58. Kumanyika SK, Ewart CK. Theoretical and baseline considerations for diet and weight control of diabetes among blacks. *Diabetes Care*. 1990;13(11):1154S-62S.
59. Quandt SA, Arcury TA, Bell RA, McDonald J, Vitolins MZ. The social and nutritional meaning of food sharing among older rural adults. *J Aging Studies*. 2001;15(2):145-62.
60. Douglas M. Deciphering a meal. *Daedalus*. 1972;101:61-82.
61. Tibbs T, Haire-Joshu D, Schechtman KB, Brownson RC, Nanney MS, Houston C, Auslander W. The relationship between parental modeling, eating patterns, and dietary intake among African-American parents. *JADA*. 2001;101(5):535-41.
62. Backman DR, Haddad EH, Lee JW, Johnston PK, Hodgkin GE. Psychosocial predictors of healthful dietary behavior in adolescents. *J Nutr Educ Behav*. 2002;34(4):184-93.
63. Stanton CA, Fries EA, Danish SJ. Racial and gender differences in the diets of rural youth and their mothers. *Am J Health Behav*. 2003;27(4):336-47.
64. Oliveria S, Ellison R, Moore L, Gillman M. Parent child relationships in nutrient intake: the Framingham children's study. *Am J Clin Nutr*. 1992;56:594-98.
65. Flynn K, Fitzgibbon M. Body image ideals of low-income African American mothers and their preadolescent daughters. *J Youth Adoles*. 1996;25(5):615-30.
66. Wagner JL, Winett RA, Walbert-Rankin J. Influences of a supermarket intervention on the food choices of parents and their children. *J Nutr Educ*. 1992;24(6):306-11.
67. Stolley MR, Fitzgibbon ML. Effects of an obesity prevention program on the eating behavior of African American mothers and daughters. *Health Educ Behav*. 1997;24:152-64.

68. Fitzgibbon ML, Stolley MR, Avellone ME, Sugerman S, Chavez N. Involving parents in cancer risk reduction: a program for Hispanic American families. *Health Psychol.* 1996;15:413-22.
69. Nicklas TA, Myers L, Reger C, Beech B, Berenson GS. Impact of breakfast consumption on nutritional adequacy of the diets of young adults in Bogalusa, Louisiana: ethnic and gender contrasts. *JADA.* 1998;98(12):1432-38.
70. Sharpe PA, Vaca VL, Granner ML, Greaney ML, Sargent RG, Rheaume C. Body size perceptions and preferences of older African-American Women. *J Nutr Elderly.* 2001;21(2):39-56.
71. Zablah EM, Reed DB, Hegsted M, Keenan MJ. Barriers to calcium intake in African-American women. *J Human Nutr Dietetics.* 1999;12:123-32.
72. Guthrie JF, Lin B, Frazao E. Role of food prepared away from home in the American diet, 1977-78 versus 1994-96: changes and consequences. *J Nutr Educ Behav.* 2002;34(3):140-50.
73. Fox TA, Block G, Heimendinger J. Telephone surveys as a method for obtaining dietary information: a review. *JADA.* 1992;92(6):729-32.
74. Yanek LR, Moy TF, Becker DM. Comparison of food frequency and dietary recall methods in African-American women. *JADA.* 2001;101(11):1361-64.
75. Posner BM, Borden WS, Ohls JC, Borman CL, Morgan JL. The validity of a telephone-administered 24-hour dietary recall methodology. *Am J Clin Nutr.* 1982;36(3):546-53.
76. Bogle M, Champagne C, Ryan D, Mellad K, McGee B, Casey PH, Davis L, Stuff J, Strickland E, Forrester I. Validity of a telephone-administered 24-hour dietary recall in telephone and non-telephone households in the rural Lower Mississippi Delta region. *JADA.* 2001;101(2):216-22.
77. Dubois S, Boivin JF. Accuracy of telephone dietary recalls in elderly subjects. *JADA.* 1990;90(12):1680-87.
78. Yaroch AL, Resnicow K, Davis M, Davis A, Smith M, Khan LK. Development of a modified picture-sort food frequency questionnaire administered to low-income, overweight, African-American adolescent girls. *JADA.* 2000;100(9):1050-56.
79. Jonnalagadda SS, Mitchell DC, Smiciklas-Wright H, Meaker KB, Van Heel N, Karmally W, Ershow AG, Kris-Etherton PM. Accuracy of energy intake data estimated by a multiple-pass, 24-hour dietary recall technique. *JADA.* 2000;100(3):303-8.

80. Briefel RR, Semplos CT, McDowell MA, Chien S, Alaimo K. Dietary methods research in the third National Health and Nutrition Examination Survey: underreporting of energy intake. *Am J Clin Nutr*. 1997;65(4):1203S-9S.
81. Johnson RK, Matthews DE, Soultanakis RP. Literacy and body fatness are associated with underreporting of energy intake in US low-income women using the multiple-pass 24-hour recall: a doubly labeled water study. *JADA*. 1998;98(10):1136-40.
82. Taren DL, Tobar M, Hill A, Howell W, Shisslak C, Bell I, Ritenbaugh C. The association of energy intake bias with psychological scores of women. *European J Clin Nutr*. 1999;53:570-8.
83. Tarasuk VS, Beaton GH. Women's dietary intakes in the context of household food insecurity. *J Nutr*. 1999;129(3):672-9.
84. Mertz W, Trui JC, Judd JT. What are people really eating? The relation between energy intake derived from estimated diet records and intake determined to maintain body weight. *Am J Clin Nutr*. 1991;54:291-5.
85. Hoidrup S, Andreasen AH, Osler M, Pedersen AN, Jorgensen LM, Jorgensen T, Schroll M, Heitmann BL. Assessment of habitual energy and macronutrient intake in adults: comparison of a seven day food record with a dietary history interview. *European J Clin Nutr*. 2002;56:105-13.
86. Variyam JN. Patterns of caloric intake and body mass index among US adults. *Food Rev*. 2002;25(3):16-20.
87. McIntyre L, Glanville NT, Raine KD, Dayle JB, Anderson B, Battaglia N. Do low-income lone mothers compromise their nutrition to feed their children? *CMAJ*. 2003;168(6):686-71.
88. Fitzgibbon ML, Stolley MR, Kirschenbaum DS. An obesity prevention pilot program for African-American mothers and daughters. *J Nutr Educ*. 1995;27:93-9.
89. Tran KM, Matthews DE, Soultanakis RP, Johnson RK. In-person vs telephone-administered multiple-pass 24-hour recalls in women: validation with doubly labeled water. *JADA*. 2000;100(7):777-80,83.
90. Airhihenbuwa CO, Kumanyika S. Cultural aspects of African American eating patterns. *Ethnicity Health*. 1996;1(3):245-59.
91. Sarlio-Lahteenkorva S, Lahelma E. Food insecurity is associated with past and present economic disadvantage and body mass index. *J Nutr*. 2001;131(11):2880-84.

92. Reicks M, Smith C, Henry H, Reimer K, Atwell J, Thomas R. Use of the Think Aloud Method to examine fruit and vegetable purchasing behaviors among low-income African American women. *J Nutr Educ Behav*. 2003;35(3):154-60.
93. Campbell MK, Symons M, Demark-Wahnefried W, Polhamus B, Bernhardt JM, McClelland JW, Washington C. Stages of change and psychosocial correlates of fruit and vegetable consumption among rural African-American church members. *Am J Health Promot*. 1998;12(3):185-91.
94. Li R, Serdula M, Bland S, Mokdad A, Bowman B, Nelson D. Trends in fruit and vegetable consumption among adults in 16 US States: Behavioral Risk Factor Surveillance System, 1990-1996. *Am J Pub Health*. 2000;90(5):777-81.
95. Cohen NL, Stoddard AM, Saroukhkhanians S, Sorensen G. Barriers toward fruit and vegetable consumption in a multiethnic worksite population. *J Nutr Educ*. 1998;20(6):381-6.
96. Patterson BH, Block G, Rosenberger WF, Pee D, Kahle LL. Fruit and vegetables in the American diet: data from the NHANES II survey. *Am J Pub Health*. 1990;80(12):1443-49.
97. Rankin JW, Winett RA, Anderson ES, Bickley PG, Moore JF, Leahy M, Harris CE, Gerkin RE. Food purchase patterns at the supermarket and their relationship to family characteristics. *J Nutr Educ*. 1998;30(2):81-8.
98. Lovejoy JC, Champagne CM, Smith SR, de Jonge L, Xie H. Ethnic differences in dietary intakes, physical activity, and energy expenditure in middle-aged, premenopausal women: the Healthy Transitions study. *Am J Clin Nutr*. 2001;74:90-5.
99. Block G, Subar AF. Estimates of nutrient intake from a food frequency questionnaire: the 1987 National Health Interview Survey. *JADA*. 1992;92:969-77.
100. Frisancho AR, Leonard WR, Bollettino LA. Blood pressure in blacks and whites and its relationship to dietary sodium and potassium intake. *J Chronic Dis*. 1994;7:515-19.
101. Clemens LHE, Slawson DL, Klesges RC. The effect of eating out on quality of diet in premenopausal women. *JADA*. 1999;99:442-44.
102. Kant AK, Block G, Schatzkin A, Ziegler RG, Nestle M. Dietary diversity in the US population, NHANES 11, 1976-1980. *JADA*. 1991;91(12):1526-31.

103. Vitolins MZ, Quandt SA, Case LD, Bell RA, Arcury TA, McDonald J. Ethnic and gender variation in the dietary intake of rural elders. *J Nutr Elderly*. 2000;19(3):15-29.
103. Krummel DA, Humphries D, Tessaro I. Focus groups on cardiovascular health in rural women: implications for practice. *J Nutr Educ Behav*. 2002;34(1):38-46.
104. Bell RA, Quandt SA, Arcury TA, McDonald J. Health behaviors of rural white, African American and Native American elders. *Am J Health Behav*. 2000;24(5):349-60.
105. Cotunga N, Subar AF, Heimendinger J, Kahle L. Nutrition and cancer prevention knowledge, beliefs, attitudes, and practices: the 1987 National Health Interview Survey. *JADA*. 1992;92:963-8.
106. Ferraro K. Are black older adults health-pessimistic? *J Health Soc Behav*. 1993;34:201-14.
107. Krebs-Smith SM, Cleveland LE, Ballard-Barbash R, Cook DA, Kahle LL. Characterizing food intake patterns of American adults. *Am J Clin Nutr*. 1997;65:1264S-68S.
108. Shawver GW, Cox RH. Need for physician referral of low-income, chronic disease patients to community nutrition education programs. *J Nutr Elderly*. 2000;20(1):17-33.
109. Kumanyika S, Savage DD, Ramirez AG, Hutchinson J, Trevino FM, Adams-Campbell LL, Watkins LO. Beliefs about high blood pressure prevention in a survey of blacks and Hispanics. *Am J Prev Med*. 1989;1:21-26.
110. Carlson SJ, Andrews MS, Bickel GW. Measuring food insecurity and hunger in the United States: development of a national benchmark measure and prevalence estimates. *J Nutr*. 1999;129(2):510S-16S.
111. History of the Food Security Measurement Project. Available at: www.ers.usda.gov/briefing/foodsecurity/history/. Accessed June 21, 2004.
112. Derrickson JP, Brown AC, Anderson JEL, Fisher AG. An assessment of various household food security measures in Hawaii has implications for national food security research and monitoring. *J Nutr*. 2001;131(3):749-47.
113. Frongillo EA Jr, Kendall A, Comenares AG, Rauschenbach RS, Olson CM. Questionnaire-based measures are valid for the identification of rural households with hunger and food insecurity. *J Nutr*. 127(5):699-705.
114. Radimer KL, Radimer KL. Measurement of household food security in the USA and other industrialised countries. *Pub Health Nutr*. 2002;5(6): 859-64.

115. Martin KS, Cook JT, Rogers BL, Joseph HM. Public versus private food assistance: barriers to participation differ by age and ethnicity. *J Nutr Educ Behav*. 2003;35(5):249-54.
116. Blumberg SJ, Bialostosky K, Hamilton WL, Briefel RR. The effectiveness of a short form of the household food security scale. *Am J Pub Health*. 1999;89(8):1231-34.
117. Measuring Household Food Security. Available at: www.ers.usda.gov/briefing/foodsecurity/measurement. Accessed June 21, 2004.
118. Olson CM, Kendall A, Wolfe WS, Frongillo EA Jr. Understanding the measurement of hunger and food insecurity in the elderly. Discussion paper 1088-96. Madison: University of Wisconsin-Madison, Institute for Research on Poverty; 1996.
119. Burt MR. Hunger among the elderly: local and national comparisons. Final report of a national study on the extent and nature of food insecurity among American seniors. Washington, DC: The Urban Institute; 1993.
120. Household Survey Tools. Available at: www.ers.usda.gov/briefing/foodsecurity/surveytools/. Accessed June 21, 2004.
121. Nord M. Food security rates are high for elderly households. *Food Rev*. 2002;25(2):19-24.
122. Conditions and Trends. Available at: www.ers.usda.gov/Briefing/FoodSecurity/trends/. Accessed June 21, 2004.
123. National Research Council. *Diet and health: implications for reducing chronic disease risk*. Washington, DC: National Academy Press; 1989.
124. Stunkard AJ, Wadden TA, eds. *Obesity: theory and therapy*, 2nd ed. New York: Raven Press; 1993.
125. Defining Overweight and Obesity. Available at: www.cdc.gov/nccdphp/dnpa/obesity/defining.htm. Accessed June 26, 2004.
126. Wadden TA, Brownell KD, Foster GD. Obesity: responding to the global epidemic. *J Counsel Clin Psych*. 2002;70(3):510-25.
127. Tilghman J. Obesity and diabetes in African American women. *ABNF J*. 2003;14(3):66-68.
128. McCance K, Heuther S. Pathophysiology: the biologic basis for disease in adults and children. St. Louis: Mosby; 2002.

129. Hoelscher DM, Day RS, Lee ES, Frankowski FR, Kelder SH, Ward JL, Scheurer ME. Measuring the prevalence of overweight in Texas schoolchildren. *Am J Pub Health*. 2004;94(6):1002-8.
130. Kuchler F, Variyam JN. Misperceptions in self-assessed weight status vary along demographic lines. *Food Rev*. 2002;25(3):21-27.
131. Body Mass Index for Adults. Available at: www.cdc.gov/nccdphp/dnpa/bmi/bmi-adult.htm. Accessed June 26, 2004.
132. Lee RD, Nieman DC. *Nutritional assessment*, 2nd ed. St. Louis: Mosby; 1996.
133. Frequently Asked Questions: BMI. Available at: www.cdc.gov/nccdphp/dnpa/bmi/faq.htm. Accessed June 26, 2004.
134. What Does This All Mean? Available at: www.cdc.gov/nccdphp/dnpa/bmi/bmi-means.htm. Accessed June 26, 2004.
135. What is Obesity? Available at: www.obesity.org/education/what.shtml. Accessed June 26, 2004.
136. BMI for Children and Teens. Available at: www.cdc.gov/nccdphp/dnpa/bmi/bmi-for-age.htm. Accessed June 26, 2004.
137. Paeratakul S, Lovejoy JC, Ryan DH, Bray GA. The relation of gender, race and socioeconomic status to obesity and obesity comorbidities in a sample of US adults. *International J Obesity*. 2002;26:1205-10.
138. Hayashi T, Boyko EJ, Leonetti DL, McNeely MJ, Newell-Morris L, Kahn SE, Fujimoto WY. Visceral adiposity is an independent predictor of incident hypertension in Japanese Americans. *Ann Intern Med*. 2004;140(12):992-1000.
139. Okosun IS, Chandra KMD, Boev A, Boltri JM, Choi ST, Parish DC, Dever GEA. Abdominal adiposity in US adults: prevalence and trends, 1960-2000. *Preventative Med*. 2004;9(1):197-206.
140. Saijo Y, Kiyota N, Kawasaki Y, Miyazaki Y, Kashimura J, Fukuda M, Kishi R. *Diabetes, Obesity, Metabolism*. 2004;6(4):249-58.
141. Wang Z, Hoy WE. Waist circumference, body mass index, hip circumference and waist-to-hip ratio as predictors of cardiovascular disease in Aboriginal people. *Eur J Clin Nutr*. 2004;58(6):888-93.
142. Prevalence of Overweight and Obesity Among Adults. Available at: www.cdc.gov/nchs/products/pubs/pubd/hestats/obese/obse99.htm. Accessed June 26, 2004.

144. Prevalence of Overweight and Obesity Among Children and Adolescents. Available at: www.cdc.gov/nchs/products/pubs/pubd/hestats/overwght99.htm. Accessed June 26, 2004.
145. Obesity Trends. Available at: www.cdc.gov/nccdphp/dnpa/obesity/trend/prev_reg.htm. Accessed June 26, 2004.
146. Hedley AA, Ogden CL, Johnson CL, Carroll MD, Curtin LR, Flegal KM. Prevalence of overweight and obesity among US children, adolescents, and adults, 1999-2002. *JAMA*. 2004;291(23):2847-50.
147. Roberts A, King J, Greenway F. Class III obesity continues to rise in African-American women. *Obes Surg*. 2004;14(4):533-35.
148. Cossrow N, Falkner B. Race/ethnic issues in obesity and obesity-related comorbidities. *J Clin Endocrinol Metab*. 2004;89(6):2590-94.
149. July F, Hawthorne D, Elliot J, Robinson W. Weight management behaviors of African American female college students. *ABNF J*. 2003;14(3):71-2.
150. Mizuno T, Shu IW, Makimura H, Mobbs C. Obesity over the life course. *Sci Aging Knowledge Environ*. 2004;24:RE4.
151. Klauer J, Aronne LJ. Managing overweight and obesity in women. *Clin Obstetrics Gynecol*. 2002;45(4):1080-1088.
152. July FM. Obesity in African American women. *ABNF J*. 2003;14(3):55.
153. Palmer CJ Jr. Body mass index, self-esteem, and suicide risk in clinically depressed African American and White American females. *J Black Psychol*. 2003;29(4):408-28.
154. Allison DB, Kanders BS, Osage GD, Faith MS, Heymsfield SB, Heber D, Foreyt JP, Elashoff RM, Blackburn GL. Weight-related attitudes and beliefs of obese African-American women. *J Nutr Educ*. 1995;27(1):18-23.
155. Flegel KM, Carroll MD, Ogden CL, Johnson CL. Prevalence and trends in obesity among US adults, 1999-2000. *JAMA*. 2002;288(14):1723-27.
156. Caldwell MB, Bronell KD, Wilfley DE. Relationship of weight, body dissatisfaction, and self-esteem in African American and White female dieters. *Int J Eat Disord*. 1997;22:127-30.
157. McTigue KM, Garrett JM, Popkin BM. Are young overweight adults destined for obesity? *Clinician Rev*. 2002;12(9):29.

158. Overweight and Obesity: Factors Contributing to Obesity. Available at: www.cdc.gov/nccdphp/dnpa/obesity/contributing_factors.htm. Accessed June 26, 2004.
159. Iannotti RJ, O'Brien RW. Parental and peer influences on food consumption of preschool African-American children. *Perceptual Motor Skills*. 1994;79:747-52.
160. Tuten C, Petosa R, Sargent R, Weston A. Biracial differences in physical activity and body composition among women. *Obes Res*. 1995;3:313-18.
161. Wolfe WS, Sobal J, Olson CM, Frongillo EA, Williamson DF. Parity-associated weight gain and its modification by sociodemographic and behavioral factors: a prospective analysis in US women. *International J Obesity*. 1997;21:802-10.
162. Smith DE. Longitudinal changes in adiposity associated with pregnancy: the CARDIA study. *JAMA*. 1994;271(22):1747-90.
163. Parker JD, Abrams B. Differences in postpartum weight retention between black and white mothers. *Obstet Gynecol*. 1993;81:768-73.
164. Keppel KG, Taffel SM. Pregnancy-related weight gain and retention: implications of the 1990 Institute of Medicine Guidelines. *Am J Pub Health*. 1993;83:1100-03.
165. Baturka N, Hornsby PP, Schorling JB. Clinical implications of body image among rural African-American women. *J Gen Intern Med*. 2000;15:235-41.
166. Ferraro KF, Thorpe RJ, Wilkinson JA. The life course of severe obesity: does childhood overweight matter? *J Gerontol*. 2003;58B(2):S110-19.
167. Jakicic JM, Wing RR. Differences in resting energy expenditure in African-American vs. Caucasian overweight females. *International J Obesity*. 1998;22:236-42.
168. Hill JO, Trowbridge FL. Childhood obesity: future directions and research priorities. *Pediatrics*. 1998;571(S).
169. Sanderson B, Littleton MA, Pulley L. Environmental, policy, and cultural factors related to physical activity among rural, African American women. *Women Health*. 2002;36(2):75-90.
170. Myers A, Rosen JC. Obesity stigmatization and coping: relation to mental health symptoms, body image, and self-esteem. *International J Obesity*. 1999;23:221-30.

171. Olson CM. Nutrition and health outcomes associated with food insecurity and hunger. *J Nutr.* 1999;129:521S-24S.
172. Jeffrey RW, French SA. Socioeconomic status and weight control practices among 20- to 45-year old women. *Am J Pub Health.* 1996;86:1005-10.
173. Averett S, Korenman S. Black-white differences in social and economic consequences of obesity. *International J Obesity.* 1999;23:166-73.
174. Hamelin A, Habicht J, Beaudry M. Food insecurity: consequences for the household and broader social implications. *J Nutr.* 1999;129:525S-28S.
175. Evenson KR, Laraia BA, Welch VLL, Perry AL. Statewide prevalences of concern about enough food, 1996-1999. *Public Health Rep.* 2002;117:358-65.
176. Dietz WH. Does hunger cause obesity? *Pediatrics.* 1995;95:766-67.
177. Frongillo EA Jr, Olson CM, Rauschenbach BS, Kendall A. Nutritional consequences of food insecurity in rural a New York State County. Discussion paper. Madison: University of Wisconsin-Madison, Institute for Research on Poverty; 1996.
178. Laraia BA, Siega-Riz AM, Evenson KR. Self-reported overweight and obesity are not associated with concern about enough food among adults in New York and Louisiana. *Preventative Medicine.* 2004;38(2):175-81.
179. Polivy J. Psychological consequences of food restriction. *JADA.* 1996;96:589-92.
180. Mokdad AH, Bowman BA, Ford ES, Bowman BA, Ford ES, Vinicor F, Marks JS, Koplan JP. The continuing epidemics of obesity and diabetes in the United States. *JAMA.* 2001;286(10):1195-1200.
181. NIH. Clinical Guidelines on the Identification, Evaluation and Treatment of Overweight and Obesity in Adults. Publication no. 98-4083. National Heart Lung and Blood Institute in Cooperation with the National Institutes of Diabetes and Digestive and Kidney Disease. Rockville, MD: National Institutes of Health; 1998.
182. Overweight and Obesity Health Consequences. Available at: www.cdc.gov/nccdphp/dnpa/obesity/consequences.htm. Accessed June 26, 2004.
183. Lemonick MD, Bjerklie D. How we grew so big. *Time.* 2004;163(23):58-64.
184. Weisberg SP. Societal change to prevent obesity. *JAMA.* 2002;288(17):217.

185. Kuchler F, Ballenger N. Societal costs of obesity: how can we assess when federal interventions will pay? *Food Rev.* 2002;25(3):33-37.
186. Fey-Yunsan N, McCormick LM, English C. Body image and weight preoccupation in older women: a review. *Healthy Weight J.* 2002;16(5):68-71.
187. Appel SJ, Harrell JS, Deng S. Racial and socioeconomic differences in risk factors for cardiovascular disease among Southern rural women. *Nurs Res.* 2002;51(3):140-47.
188. Lieberman LS, Probart CK, Schoenberg NE. Body image among older, rural, African-American women with type 2 diabetes. *Coll Antropol.* 2003;27(1):79-86.
189. Mehrotra C, Naimi TS, Serdula M, Bolen J, Pearson K. Arthritis, body mass index, and professional advice to lose weight: implications for clinical medicine and public health. *Am J Preventative Medicine.* 2004;27(1):16-21.
190. Hill AJ, Williams J. Psychological health in a non-clinical sample of obese women. *International J Obesity.* 1998;22:578-83.
191. Walker ARP, Adam F, Walker BF. World pandemic of obesity: the situation in Southern African populations. *Pub Health.* 2001;115:368-72.
192. Ramsey PW, Lee GL. Obesity and health status in rural, urban, and suburban Southern women. *Southern Medical J.* 2002;95(7):666-71.
193. Overweight and Obesity: Economic Consequences. Available at: www.cdc.gov/nccdphp/dnpa/obesity/economic_consequences.htm. Accessed June 26, 2004.
194. U.S. Department of Health and Human Services. The Surgeon General's call to action to prevent and decrease overweight and obesity. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Office of the Surgeon General; 2001.
195. Millman M. *Such a Pretty Face*. New York: W.W. Norton; 1980.
196. Neumark-Sztainer D, Story M, Faibisch L, Ohlson J, Adamiak M. Issues of self-image among overweight African-American and Caucasian adolescent girls: a qualitative study. *J Nutr Educ.* 1999;31(6):311-20.
197. Rolls BJ, Engell D, Birch LL. Serving portion size influences 5-year-old but not 3-year-old children's food intakes. *JADA.* 2000;100:232-34.
198. Cullen LT. Not too rich or too thin. *Time.* 2004;163(23):69.

199. Cossrow NHF, Jeffery RW, McGuire MT. Understanding weight stigmatization: a focus group study. *J Nutr Educ.* 2001;33(4):208-14.
200. Crandall CS. Prejudice against fat people: ideology and self-interest. *J Pers Soc Psych.* 1994;66:882-894.
201. Hutchinson MG. Imagining ourselves whole: a feminist approach to treating body image disorders. In: Fallon P, Katzman MA, Wooley SC, eds. *Feminist Perspectives on Eating Disorders*. New York: Guilford Press; 1994.
202. Rand CW, MacGregor AMC. Morbidly obese patients' perceptions of social discrimination before and after surgery for obesity. *South Med J.* 1990;83:1391-95.
203. Rothblum ED, Brand P, Miller C, Oetjen H. Results of the NAAFA survey on employment discrimination: part II. *NAAFA Newsletter.* 1989;17:4-6.
204. Neumark-Sztainer D, Story M, Faibisch L. Perceived stigmatization among overweight African-American and Caucasian adolescent girls. *J Adoles Health.* 1998;23(5):264-70.
205. Cattarin JA, Thompson JK. A three-year longitudinal study of body image, eating disturbance, and general psychological functioning in adolescent females. *Eating Dis: J Treatment and Prev.* 1994;2:114-25.
206. Stunkard AJ, Wadden TA. Psychological aspects of severe obesity. *Am J Clin Nutr.* 1992;55:524S-32S.
207. Perception of Teasing Scale (POTS). Available at: <http://luna.cas.usf.edu/~jthomps1/POTSweb.html>. Accessed June 29, 2004.
208. Thompson JK, Cattarin J, Fowler B, Fisher E. The perception of teasing scale (POTS): a revision and extension of the Physical Appearance Related Teasing Scale (PARTS). *J Personality Assess.* 1995;65(1):146-57.
209. Smith DE, Thompson JK, Raczyński SJ, Hilner JE. Body image among men and women in a biracial cohort: the CARDIA study. *Int J Eat Disord.* 1999;25(1):71-82.
210. Roth D, Armstrong J. Feelings of fatness questionnaire: a measure of the cross-situational variability of body experience. *Int J Eat Disord.* 1993;14(3):349-58.
211. Patel KA, Gray JJ. Judgment accuracy in body preferences among African Americans. *Sex Roles.* 2001;44(3/4):227-235.

212. Bulik CM, Wade TD, Heath AC, Martin NG, Stunkard AJ, Eaves LJ. Relating body mass index to figural stimuli: population-based normative data for Caucasians. *Int J Obesity*. 2001;25:1517-24.
213. Stevens J, Kumanyika SK, Keil JE. Attitudes toward body size and dieting: differences between elderly Black and White women. *Am J Pub Health*. 1994;84(8):1322-25.
214. Thompson JK, Altabe MN. Psychometric qualities of the Figure Rating Scale. *Int J Eat Disord*. 1991;10:615-19.
215. Abrams LS, Stormer CC. Sociocultural variations in the body image perceptions of urban adolescent females. *J Youth Adolesc*. 2002;31(6):443-50.
216. Russell WD, Cox RH. Social physique anxiety, body dissatisfaction, and self-esteem in college females of differing exercise frequency, perceived weight discrepancy, and race. *J Sport Behavior*. 2003;26(3):298-318.
217. Jacob AV. Body image distortion and eating disorders: no longer a 'culture-bound' topic. *Healthy Weight J*. 2001;15(6):93-5.
218. Kashubeck-West S, Saunders K. Body image. In: Robert-McComb JJ, ed. *Eating Disorders in Women and Children: Prevention, Stress Management, and Treatment*. Boca Raton, FL: CRC Press; 2001.
219. Lovejoy M. Disturbances in the social body: differences in body image and eating problems among African American and White women. *Gender Soc*. 2001;15(2):239-61.
220. Olby BC. Perceived attractiveness and personality attributes: a gender and racial analysis. *Dissertation Abstracts International: Section B: The Sciences and Engineering*. 2003;63(9B):4420.
221. Mossavar-Rahmani Y, Peltó GH, Ferris AM, Allen LH. Determinants of body size perceptions and dieting behavior in a multiethnic group of hospital staff women. *JADA*. 1996;96:252-56.
222. Rosen EF, Brown A, Braden J, Dorsett HW, Franklin DN, Garlington RA, Kent VE, Lewis TT, Petty LC. African-American males prefer a larger female body silhouette than do Whites. *Bulletin Psychonomic Soc*. 1993;31(6):599-601.
223. Kumanyika S, Wilson J, Guilford-Davenport M. Weight-related attitudes and behaviors of Black women. *JADA*. 1993;93:416-22.

224. Cachelin FM, Rebeck RM, Chung GH, Pelayo E. Does ethnicity influence body-size preference? A comparison of body image and body size. *Obesity Res.* 2002;10(3):158-66.
225. Williamson L. Eating disorders and the cultural forces behind the drive for thinness: are African American women really protected? *Social Work in Health Care.* 1998;28(1):61-73.
226. Abrams KK, Allen LR, Gray JJ. Disordered eating attitudes and behaviors, psychological adjustment, and ethnic identity: a comparison of Black and White female college students. *Int J Eat Disord.* 1993;14:49-57.
227. Allen JD, May K, Michel Y. Body size values of White and Black women. *Res Nurs Health.* 1993;6:3-14.
228. Grey-Little B, Hafdahl AR. Factors influencing racial comparisons of self-esteem: a quantitative review. *Psychol Bulletin.* 2000;126(1):26-54.
229. Levin S, Mayer-Davis EJ, Ainsworth BE, Addy CL, Wheeler RC. Racial/ethnic health disparities in South Carolina and the role of rural locality and educational attainment. *Southern Med J.* 2001;94(7):711-18
230. Greenberg MR, Schneider D, Northridge ME. Region of birth and black diets: the Harlem Household Survey. *Am J Pub Health.* 1998;88(8):1199-1202.
231. Medicaid Annual Report. Available at: www.dhh.state.la.us/medicaid. Accessed July 19, 2004.
232. Gunderson C, Gruber, J. The dynamic determinants of food insufficiency. In: Andrews M, Prell M, eds. *Second Food Security Measurement and Research Conference Vol II: Papers.* Washington, DC: USDA, ERS; 2001.
233. Cristofar SP, Basiotis PP. Dietary intakes and selected characteristics of women ages 19-50 years and their children ages 1-5 years by reported perception of food sufficiency. *J Nutr Educ.* 1992;24:53-58.
234. Bjorntorp P. Metabolic implications of body fat distribution. *Diabetes Care.* 1991;14(12):1132-43.
235. Rosmond R, Bouchard C, Bjorntorp P. Allelic variants in the GABA- α -6 receptor subunit gene (GABRA6) is associated with abdominal obesity and cortisol secretion. *Int J Obesity.* 2002;26(7):938-41.
236. Bjorntorp P. Do stress reactions cause abdominal obesity and comorbidities? *Obesity Reviews.* 2001;2(2):73-86.

237. Tsujii S, Kuzuya H. The significance of lifestyle as a risk factor for the metabolic syndrome. *Nippon Rinsho*. 2004;62(6):1047-52.
238. Bjorntorp P. Endocrine abnormalities of obesity. *Metabolism*. 1995;44(9):21S-23S.