

A Cross-Cultural Perspective on Obesity and Health in Three Groups of Women: The Mississippi Choctaw, American Samoans, and African Americans

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ABSTRACT

This study compares obesity as assessed by Body Mass Index (BMI) and the relationship of BMI to hypertension and diabetes in adult females from three populations, the Mississippi Band of Choctaw (N=50), American Samoa (N=155), and an African American community in West Alabama (N=367). These groups were surveyed in the early to mid 1990s. All three groups of women have very high levels of overweight and obesity, with the Samoans being most extreme in this regard. While there are indications that all three groups of women consume a calorically dense diet, low activity appears to be the most likely causal factor in the high rates of obesity. Relaxed negative attitudes toward an overweight/obese body image may also play a role in the high rates. The prevalences of hypertension and diabetes are alarmingly high in all three groups. There are, however, very different associations between BMI, hypertension, and diabetes in the three groups of women. The Samoans are substantially more obese (and older), but they have lower rates of hypertension than the African American women and lower rates of diabetes than the Choctaw women. While the genetic background of the three groups no doubt plays a role, it is also likely that a BMI of 30+, the common cutoff for obesity, means different things in these different populations. These results provide further support for the idea of variation in the relationship of BMI to disease in different populations.

Key words: BMI, obesity, hypertension, diabetes

Introduction

Understanding patterns of variation in chronic diseases within and between populations is one of the goals of biological anthropology¹. The current pattern and epidemic of chronic disease is part and parcel of the human evolutionary record². Many chronic diseases have spread to populations around the globe along with the relatively recent process of socioeconomic modernization and especially increasing frequencies of obesity³⁻⁵. Some of the body measurements traditionally taken by biological anthropologists and used to characterize morphological variation within and between populations are affected by obesity and are strongly associated with the chronic de-

generative diseases or risk factors for these diseases. Substantial work has been done to document the association between certain indicators of body habitus and cardiovascular diseases (CVD) and type II diabetes⁶⁻¹¹. From the perspective of biological anthropology, it is significant that the nature of the association between obesity and health may differ in various populations based on the underlying genetic landscape and the specific environmental context¹²⁻¹⁵. Additionally, it is clear that body mass index, the most common diagnostic measure for obesity, is associated with different levels of fatness and different disease risks in different populations^{16,17}.

An Anthropological Perspective on Obesity

Brown and Konner provided an excellent introduction to an anthropological perspective on obesity in their 1987 article on the topic¹⁸. They approached obesity from a broad cross-cultural and diachronic perspective and drew three generalizations about the prevalence and patterning of obesity in human groups. They suggested that the higher levels of fatness and risk of obesity that are found in females in most populations is part of the normal species sexual dimorphism in *Homo sapiens*. They made the adaptive argument that based on cross-cultural research, food scarcity has been a very common feature of human ecology in our evolutionary past and females with greater fat stores are buffered from periodic scarcity, providing energy for nursing and fetuses. Further, they noted that there is a modernization effect on the prevalence of obesity such that unacculturated populations show very low rates of obesity, but the prevalence tends to increase rapidly as societies become engaged in the world economy. They also reiterated the finding that the prevalence of obesity increases with social class in developing societies but among females, in particular, in developed societies obesity tends to decrease with increasing social class.

Among cultural factors influencing obesity, changing perceptions of ideal body shape are key to the association of obesity with social class¹⁸. Brown and Konner argued that as societies globalize, the initial tendency is toward favoring obesity to emulate the body build of the upper classes, but as development proceeds there is an emphasis on thinness, especially for women. As they note, »Thinness, like tanning, is a contemporary symbol of economic status and leisure time for women. Both may be unhealthy, and both represent reversals of previous ideals«^{18, page 44}. In an examination of cross-cultural standards of female beauty based on the HRAF, Brown and Konner found that 81% of 38 societies with sufficient data favored a plump to moderately fat body build for females with 19% favoring a thin body and none preferring an extremely obese body type. It appears that there is a tendency to prefer a moderately fat female habitus visually, suggesting health and fecundity.

In addition to the positive and negative association of socioeconomic status with obesity in developing and developed societies, there is a transition point where social class does not show a significant association with obesity. This concept is illustrated by the work of Ezeamama and colleagues¹⁹ in their assessment of CVD risk factors in Samoans in less and more developed contexts. They propose a curvilinear model of the relationship of socioeconomic status (SES) to CVD risk factors, morbidity, and mortality, with different segments of different populations being located at different points along this inverted parabolic curve. In their Figure 1 (page 2534) they locate Samoa and American Samoa on this hypothetical curve, and this informs their analysis. The position of a population along this curve is going to predict the association between SES and obesity. Beyond simple indicators of socioeconomic status, there may be emically-defined cul-

tural effects on BMI. Dressler and colleagues found a significant association between cultural consonance (behaviorally adhering to a cultural model) in the domains of lifestyle (those adopting a more culturally appropriate lifestyle have smaller waists) and consumption of high prestige foods (those consuming more high prestige foods have smaller waists) for women but not men²⁰. This finding of cultural consonance suggests some of the underlying ways that the SES by BMI association may operate.

Obesity is ultimately, biologically, the result of a medium to long-term positive energy balance. The two components of energy balance are dietary intake and caloric expenditure. Caloric intake varies from individual to individual and from day to day within populations. The most variable aspect of expenditure is due to differences in activity patterns between individuals. Given the limitations of dietary survey techniques, it is very difficult to show associations between diet and obesity³. Activity, even when evaluated very simplistically by questionnaire techniques, frequently shows an association with obesity within groups³.

While there are many studies of obesity among females, there are relatively few that seek to understand it in a cross-cultural perspective similar to that used by Brown and Konner¹⁸. This study seeks to explore the associations between measures of obesity and risk of cardiovascular diseases and diabetes in a cross-cultural context. First the distribution of obesity in the Mississippi Band of Choctaw Indians, American Samoans, and African Americans in Alabama is presented along with factors that might impact that distribution. Next associations of obesity with hypertension and diabetes are examined for the women in these populations. Finally, recent developments in obesity for these populations are considered.

Methods and Techniques

These studies were conducted in 1991 among the Choctaw, 1992 in American Samoa, and 1993–1996 among African Americans, using comparable equipment and techniques and overlapping personnel. The Choctaw sample comprised 50 females over the age of 21. Among the Choctaw, tribal rolls were used to draw a simple random sample of adults over the age of 21. The females surveyed constituted about five percent of the eligible population. More details on the Choctaw sample are given by Dressler and colleagues²¹. The Samoan sample included 155 females over the age of 18 from 135 different households on the island of Tutuila, American Samoa. The households sampled represent approximately two percent of the households on Tutuila. Details of the sampling for the Samoan project are presented by Bindon and colleagues²². The African American sample included 367 females between 25 and 65 years of age, randomly selected from the community and constituting about five percent of the eligible population. Dressler and Bindon describe the details of this sampling process²³. While each survey used slightly different sampling techniques, we have argued elsewhere that the samples are reasonably representative of their communities for the variables of interest here^{21,22,24}.

In all studies trained anthropometrists took body build measures. Height was measured to the nearest millimeter with free-standing anthropometers and weight to the nearest half-pound following the methods outlined by Lohman and colleagues²⁵.

Results

Age, sex, energy balance, and obesity

The Samoan females are significantly older on average than the African American or Choctaw samples (Table 1). All comparisons of means of BMI have been adjusted for age to accommodate these differences. The Samoan females have significantly higher age-adjusted average body mass indices than either the Choctaw or African American women. Average annual household income did not differ for the three groups.

All three of the samples showed extremely high rates of obesity as illustrated in Table 2. Males from the three populations are presented here to address Brown and Konner’s ideas about sexual dimorphism in obesity¹⁸. Using the WHO criterion of a body mass index equal to or greater than 30 as the obesity cutoff²⁶, 51.2% of the Choctaw males, 66.7% of the Samoan males, 30.9% of the African American males were obese. For the females, the figures were 52% of the Choctaw, 85.6% of the Samoans, and 59.1% of the African Americans. Females had a significantly higher prevalence of obesity than the males for the Samoans and the African Americans.

The distribution of females in the normal ($18.5 \leq \text{BMI} < 25$), overweight ($25 \leq \text{BMI} < 30$), and obese ($30 \leq \text{BMI}$), categories is presented with the CDC national U.S. sample of females from 2004²⁷ for comparison in Table 3. Each of the three groups of females shows substantial excesses in the obese category and deficits in the normal weight category by comparison to the CDC sample.

As to energy balance, the two segments of dietary intake and activity or expenditure were not studied the same way across the three populations. For the Choctaw, there is no dietary intake information available. For the Samoans, there are a number of dietary studies available, although dietary intake was not studied among the women presented in this research. Other studies of Samoans have been unable to demonstrate a relationship between obesity and dietary intake, either in types of foods consumed or in the overall energy intake^{3,28}. Habit-

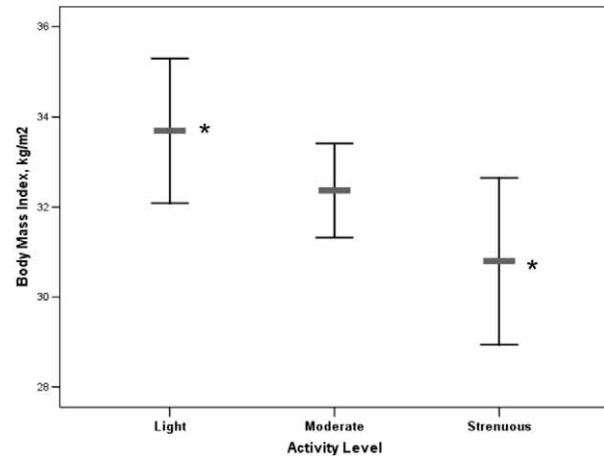


Fig. 1. Average body mass index by activity level for African American women.

TABLE 2
RATES OF OBESITY (BMI ≥ 30) FOR MALES AND FEMALES IN THREE POPULATIONS

	Choctaw	Samoans	African Americans
Males	51.2%	66.7%	30.9%
Females	52.0%	85.6%	59.1%

ual dietary behavior was studied among the African American females presented here and there was no association between BMI and caloric intake, macronutrient intake (as grams or % of caloric intake), or frequency of consumption of fast food and eating out. For the activity side of the energy balance equation, energy expenditure has been very loosely surveyed in each of these samples using short questionnaires about activity during work and leisure time. Among the Choctaw women, there was no association between reported activity and BMI. For the Samoan women, the current study did not show an association between reported activity and BMI, but other studies have documented activity effects on obesity among Samoan adults^{3,28}.

Among the African American women, there was a small effect of activity demonstrated on BMI for this group. The group with the lowest reported total activity

TABLE 1
DESCRIPTIVE STATISTICS FOR THE THREE GROUPS OF WOMEN

	Choctaw	Samoan	African American
Sample	50	155	367
Age ^a , years	42.8	54.8	45.8
BMI ^b , kg/m ²	32.0	36.9	32.5
Average Annual Income, \$U.S.	\$13,976	\$14,063	\$16,133

^a Average age of Samoan women significantly greater than Choctaw or African American women ($p < 0.05$).

^b Average BMI of Samoan women significantly greater than Choctaw or African American women ($p < 0.05$) after adjusting for age.

TABLE 3
PERCENT OF WOMEN IN BMI CATEGORIES IN THREE POPULATIONS COMPARED TO CDC FIGURES FOR U.S. FEMALES IN 2004

BMI category	Choctaw	Samoan	African American ^a	CDC 2004
Normal, BMI ≤ 25	12.0%	5.2%	16.7%	28.0%
Overweight, 25 < BMI < 30	36.0%	9.2%	24.0%	39.0%
Obese, BMI ≥ 30	52.0%	85.6%	59.2%	33.0%

^a One African American female had a body mass index of 18.2, below the lower boundary of the normal weight category. She has been included in the normal weight category in this table.

had a significantly higher average BMI than the women from the most strenuous activity group (see Figure 1). Note that the women in the most active group still have an average BMI in excess of the standard 30 cutoff point for obesity.

SES, body image, and obesity

All three groups of females showed no association between education or income and body mass index as illustrated in Figure 2. These populations would be located at the apex of the curvilinear model of SES and CVD risk proposed by Ezeamama and colleagues¹⁹. The women in all three groups are between the positive side of the curve for developing populations and the negative side for developed groups.

While none of the studies reported on here incorporated body image surveys, there are some indications available of how these groups view female body build. Choctaw body image was the most elusive to get a fix on. There are no specific studies of body image with either western (Oklahoma) or eastern Choctaw bands, and there are relatively few observations about body image among Native Americans in general. Most available studies focus on children and adolescents and the findings generally show substantial levels of dissatisfaction with current body build, comparable to other populations. This dissatisfaction is primarily because the children view themselves as too fat. Rates of dieting among Native Americans were second only to Hispanic adolescents in one study of ethnic children in the U.S.²⁹ There is awareness of an obesity-diabetes link that motivates some body dissatisfaction among Native Americans, but it is unclear how much this may serve to induce dieting or other weight-loss behavior³⁰.

Body of image of Samoans has been studied by Brewis and colleagues³¹. They reported that Samoans have a relatively thin ideal body image for females and that the disparity between their ideal and their current weight is greater for Samoans living in Auckland, New Zealand than for those in Samoa. Modernization as embodied by migration to New Zealand appears to be working both to increase weight and to decrease ideals. In spite of these findings, the researchers note that the Samoans do not have a strongly negative view of obesity, so there is less stigma attached to large body size for males or females than in many societies.

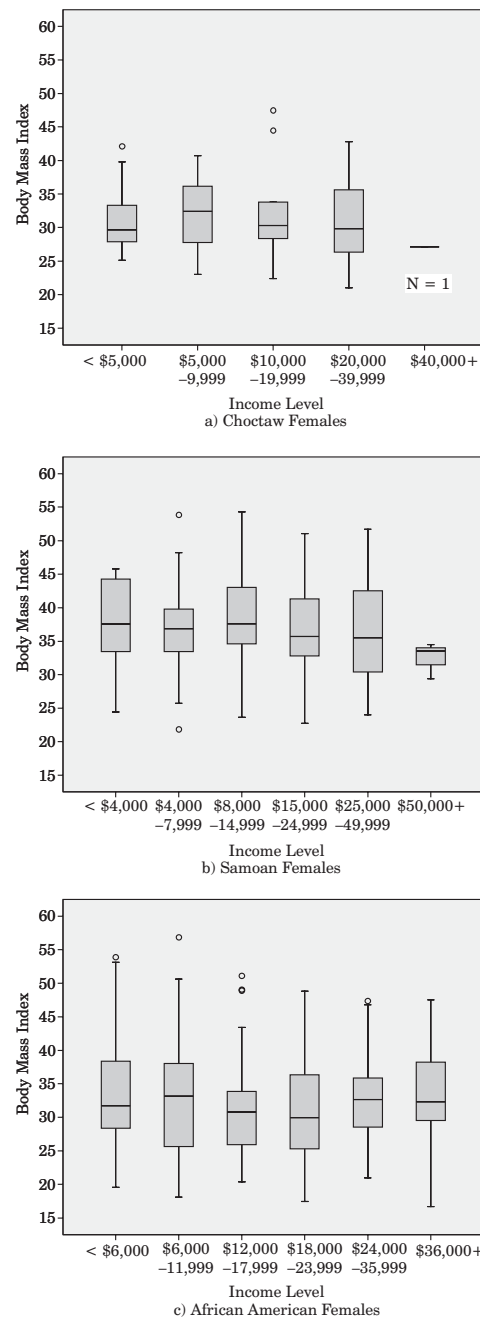


Fig. 2. Average body mass index by income level for three groups of women.

There have been many studies of body image among African American women, and a common finding is a desired body image that corresponds to the overweight category ($25 \leq \text{BMI} < 30$). For example, Baptiste-Roberts and colleagues studied body image and BMI among 141 African American females with type 2 diabetes³². In addition to a general increase in the perception of their own body size with increasing BMI, they reported that the desired body image of the women corresponded to a BMI of 27.7, in the middle of the overweight category according to most sources.

Insight into the perceptions of body image that have been reported for these populations may be provided by a recent review of body image in minority communities by Kumanyika and Grier who note:

»In communities where most women or adults are obese, as in many ethnic minority and low-income communities, attitudes, norms, behaviors, and cultural influences may be in equilibrium with a high level of obesity. There may be a mixture of positive and negative attitudes about being overweight, especially where people who are thin are thought to be sick, addicted to drugs, too poor to have enough to eat, or to risk 'wasting away' in the case of food shortage or of serious illness. In such environments, parents and other family members may consider being overweight as normal, perhaps determined by heredity. *Shapeliness, robustness, and nurturing qualities may be standards of female attractiveness that encourage the overall acceptance of people who – by BMI standards – are otherwise considered overweight or obese* (Emphasis added).³³, pages 198–199

Obesity, CVD, and diabetes

In each survey, the subjects were queried about prior diagnoses of hypertension or diabetes. Each of these populations must deal with substantially different health care systems and different problems in obtaining access to the system. The health care system in American Samoa is run by the Government of American Samoa and is essentially free of charge, as is the case with the Choctaw health care system run by the Indian Health Service. By contrast, the African Americans in the study are subject to a wide range of different options and choices in engaging with the local health care system in Alabama from

Medicaid to employer-provided health insurance to uncovered individuals. These differences must be acknowledged when discussing differences in issues such as diagnoses and treatment of hypertension and diabetes. Table 4 presents the positive responses to the question about hypertension and diabetes diagnoses. Forty percent of the Choctaw females, 26.5% of the Samoans, and 52.3% percent of the African Americans reported a prior diagnosis of hypertension. Twenty-eight percent of the Choctaw females, 18.7% of the Samoans, and 15% percent of the African Americans reported a prior diagnosis of diabetes.

Discussion

While there are significant limitations of the work presented here, not the least of which is the lack of substantial cultural information about perceptions of body size and perceptions of life style in these three samples, there are some important points to note from these three groups. First, the three groups generally bear out the generalizations about sexual dimorphism of obesity noted by Brown and Konner¹⁸. Additionally, these women belong to populations with very high rates of obesity. The American Samoan women have obesity prevalences that are among the highest in the world, and they have substantially higher rates of obesity than the other two groups, even after adjusting for the age differences of the samples. The etiological factor most likely playing a role in obesity for these three populations is low activity. While this can only be demonstrated with the current dataset for the African American females, there are many indications in the literature that it is true for the other two groups as well.

The association of obesity with risk factors, chronic disease, and mortality varies from population to population in an often confusing manner, and this is borne out in the results presented here. While the American Samoan women were substantially more obese than the other two groups as well as being significantly older, they did not show the highest rates of either hypertension or diabetes. Rather, the African American females with lower age, lower average BMI, and 70% of the obesity prevalence of the American Samoan females report almost twice as high a frequency of hypertension. The Choctaw females with lower age, lower average BMI and 60% of the obesity found in the American Samoan females reported diabetes rates 50% higher than the Samoan females. Many studies show a characteristic U or J shaped association between BMI or WHR and mortality with mortality being highest for the extremes of the distribution³⁴. However, many other studies find no such pattern while demonstrating population differences in the BMI-mortality relationship¹⁵, and some studies have documented a negative association between mortality and BMI as did Hodge and colleagues for Nauran Males³⁵. There are obviously many complicating environmental and cultural factors including smoking, diet, activity, and psychosocial stress which are likely to affect the shape of the body habitus-mortality curve. However, some research, such as that of Hodge et al.³⁵, demonstrates substantial differences even after carefully controlling for many of these factors.

TABLE 4
PERCENT OF FEMALES WITH SELF-REPORTED DIAGNOSIS OF HYPERTENSION OR DIABETES IN THREE POPULATIONS

Group	Percent with self-reported previous diagnosis of:	
	Hypertension ^a	Diabetes ^b
Choctaw	40.0	28.0
Samoans	26.5	18.7
African Americans	52.3	15.0

^a Chi-square (group by hypertension), 2 d.f. = 29.951, $p < 0.001$

^b Chi-square (group by diabetes), 2 d.f. = 5.621, $p = 0.06$

As messy as the body habitus-mortality association is, the situation is even more confusing for body habitus and chronic disease diagnoses or risk factors. Clark and Mungai found that higher BMI was associated with reports of significantly more frequent and severe hypertension, diabetes, and heart disease among African American women³⁶. Cooper and coworkers found increasing rates of hypertension with increasing BMIs in their study of African diaspora populations, although the relationship between BMI and blood pressure may have varied significantly across the different populations studied³⁷.

The use of BMI to clinically diagnose overweight and obesity with cutoff points based on minimum mortality risk has led to revisions in these cutoff points in recent years. That is not to say that the criteria are any more cross-culturally appropriate than they were before. A BMI of 30 has one set of health implications for household heads who are adult female Euro-Americans living below the poverty level with less than a high school education, and a different implication for virtually any other population segment one might name. Several researchers have attacked the one-size fits all use of BMI criteria for overweight and obesity. In some populations, the cutoff points for obesity should be set higher than 30 based on cross-cultural comparisons of body composition as it relates to BMI. Polynesians, for example, have a substantially higher bone and muscle mass at a given BMI than most other populations¹⁶. By contrast, many Asian populations show substantially higher levels of body fat at a given BMI, suggesting that their obesity cutoff should be set lower than 30¹⁷. While it is important to establish health related BMI criteria, human biologists can bring an important element to this issue by continuing to reinforce the significance of the variability in the association of BMI with body fat and other physiological indicators from one group to another.

The contrasting findings by various researchers about the association between body build and chronic disease serve to emphasize the complexity of the genotype by environment interaction involved in the natural history of chronic diseases in different populations. In the present study, we have described the nature of this association for females from three particular populations at specific points in time. The Choctaw situation in particular has changed dramatically since the time of the study. Shortly after the survey the tribe began opening up casinos and the socioeconomic context on the reservation changed substantially as a result and it is likely that their BMI and obesity profile is more in line with the other two populations presented here, although it is unlikely the Samoans or African Americans have remained the same or decreased their rates of obesity.

Update on obesity in the three populations

Choctaw: With the advent of the casino complex on the reservation within a few years of our original study, lifestyles changed substantially for the Mississippi Choctaw. The casino income likely helped to increase obesity among the Mississippi Choctaw as their SES has rapidly

increased. An anecdotal support for this can be seen from the following newspaper item taken from *The Guardian*, May 2, 2002:

»Obesity kills 300,000 people a year in America and is the nation's number-one health hazard. Nowhere is this more true than in Mississippi, where food is cheap and exercise unheard of. [The reporter] visits the heaviest state of a country that is in danger of busting the scales. The clientele on the slot machines in the Starlight Lounge of the casino on the Choctaw reservation in Neshoba County are fairly substantial, though they are outweighed by the customers of the Piggly Wiggly supermarket next door, where the Choctaw shop. There may be nowhere at all to match aisle 10 in Piggly Wiggly's, between the Brown Cow ice-cream ('swirled with thick, rich chocolate syrup') and the giant-sized packs of bacon-and-cheddar fries³⁸.

Samoans: As reported by Dr. McGarvey at the conference on "Anthropological Perspectives on Women and Obesity" at Hvar in June 2006, obesity prevalence among Samoans continues to be among the highest of any population in the world. Researchers from the American Samoan Community College and the U.S. Army that I have collaborated with in the past year have conducted growth studies which indicate that the rate of obesity among children and adolescents has continued to grow alarmingly from previous surveys. With the first successful global fast food chain (McDonald's[®]) taking root in American Samoa in 2000 it is not likely that the obesity epidemic among Samoans will turn around anytime soon.

African Americans in West Alabama: Alabama had the highest level of adult obesity in the U.S. at 28.4% in 2004²⁷ (2nd highest in 2006—Mississippi was highest, with Alabama taking the #2 spot for the second consecutive year³⁹), and the 7th highest overweight levels for high school students at 13.5%. The state spent an estimated \$293 per person in 2003 on medical-costs related to obesity, the 9th highest amount in the nation²⁷. Within Alabama, African Americans have the highest percentage of obesity of any ethnic group, and there is currently no successful program to combat this problem.

Summary

These three groups all exhibited very high rates of overweight and obesity among women when they were surveyed in the 1990s. The Samoan women show a prevalence of obesity that is among the highest found in contemporary populations. Etiological factors for obesity in these groups are complicated and not well defined by the current study. There are some indications in the current work that activity levels are associated with obesity for African American women and from previous work that this association holds for the Samoan women. All three groups have substantial rates of obesity related disorders including hypertension and diabetes, however, the association between obesity and illness does not hold across the three groups. This study provides additional evidence

that elevated body mass indices may have different health implications in different populations. In a 21st Century update on the obesity status of these groups, all three groups of women appear to be holding or slightly increasing the prevalence of obesity from the work done in the 1990s.

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McGarvey helped shaped the discussion of socioeconomic factors, although he is not to blame for our conclusions. We thank the assistance we received from health departments and practitioners in each of these groups, the numerous research assistants and graduate students who conducted the surveys and the gracious Samoans, Native Americans, and African Americans that cooperated in our work.

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REFERENCES

1. CREWS DE, GERBER LM, Chronic degenerative diseases and aging. In: CREWS DE, GARRUTO RM (Eds), *Biological anthropology and aging: perspectives on human variation over the life span* (Oxford University Press, New York, 1994). — 2. CREWS DE, JAMES GD, Human evolution and the genetic epidemiology of chronic degenerative diseases. In: MASCIE-TAYLOR CGN, LASKER GW (Eds), *Applications of biological anthropology to human affairs* (Cambridge University Press, Cambridge, 1991). — 3. BINDON JR, Polynesian responses to modernization: Overweight and obesity in the South Pacific. In: DE GARINE I POLLOCK N (Eds.): *Social Aspects of Obesity*. (Gordon and Breach, London, 1995). — 4. MCGARVEY ST, BINDON JR, CREWS DE, SCHENDEL DE, Modernization and adiposity: causes and consequences. In: LITTLE MA, HAAS JD (Eds): *Human population biology: a transdisciplinary science* (Oxford University Press, London, 1989). — 5. TAUBES G, *Science* 280 (1998) 1368. — 6. BINDON JR, CREWS DE, *Am J Hum Biol* 5 (1993) 31. — 7. HEBERT JR, HURLEY TG, HSIEH J, ROGERS E, STODDARD AM, SORENSEN G, NICOLosi RJ, *Am J Epidemiol* 140 (1994) 132. — 8. VAN ITALLIE TB, Topography of body fat: relationship to risk of cardiovascular and other diseases. In: LOHMAN TG, ROCHE AF, MARTORELL R (Eds) *Anthropometric standardization reference manual* (Human Kinetics, Champaign, IL, 1988). — 9. VALDEZ R, SEIDELL JC, AHN YI, WEISS KM, *Int J Obes Relat Metab Disord* 16 (1992) 77. — 10. MUELLER WH, MEININGER JC, LIEHR P, CHAN W, CHANGLER PS, *Am J Hum Biol* 8 (1996) 489. — 11. KIM SK, ROBBINS D, TURNER M, ADAMS-CAMPBELL LL, *Am J Hum Biol* 10 (1998) 249. — 12. CREWS DE, BINDON JR, KAMBOH MI, *Am J Hum Biol* 5 (1993) 39. — 13. DOWLING HJ, PI-SUNYER FX, *Diabetes* 42 (1993) 537. — 14. LOVEJOY JC, DE LA BRETONNE JA, KLEMPERER M, TULLEY R, *Metabolism* 45 (1996) 1119. — 15. STEVENS J, KEIL JE, RUST PF, TYROLER HA, DAVIS CE, GAZES PC, *Arch Intern Med* 152 (1992) 1257. — 16. SWINBURN BA, LEY SJ, CARMICHAEL HE, PLANK LD, *Int J Obes* 23 (1999) 1178. — 17. PRENTICE AM, JEBB SA, *Obesity Reviews* 2 (2001) 141. — 18. BROWN PJ, KONNER M. *Ann N Y Acad Sci* 499 (1987) 29. — 19. EZEAMAMA AE, VIALI S, TUITTELE J, MCGARVEY ST, *Soc Sci Med*

63 (2006) 2533. — 20. DRESSLER WW, OTHS KS, RIBEIRO RP, BALIEIRO MC, DOS SANTOS JE, unpublished manuscript). *Cultural Consonance and Adult Body Composition in Urban Brazil*. — 21. DRESSLER WW, BINDON JR, GILLILAND MJ, *Med Anthropol* 17 (1996) 165. — 22. BINDON JR, KNIGHT A, DRESSLER WW, CREWS DE, *Am J Phys Anthropol* 103 (1997) 7. — 23. DRESSLER WW, JR BINDON. *Am Anthropol*, 102 (2000) 244. — 24. DRESSLER WW, BINDON JR, NEGGERS Y, *Psychosom Med* 60 (1998) 620. — 25. LOHMAN TG, ROCHE AF, MARTORELL R (Eds), *Anthropometric standardization reference manual* (Human Kinetics, Champaign, IL: 1988). — 26. SEIDELL J, FLEGAL K, *Br Med Bull* 53 (1997) 238. — 27. TRUST FOR AMERICAS HEALTH, New report finds 41 states have obesity levels over 20 percent, Available from: <http://healthyamericans.org/newsroom/releases/release102004.pdf>, accessed December 8, 2006. — 28. BINDON JR, Coming of age of human adaptation studies in Samoa. In: ULLJASZEK SJ HUSS-ASHMORE RA (Eds). In: *Human adaptability: past, present, and future*. (Oxford University Press, Oxford, 1997). — 29. NEUMARK-SZTAINER D, CROLL J, STORY M, HANNAN PJ, FRENCH SA, PERRY C, *J Psychosom Res* 53 (2002) 963. — 30. RINDERKNECHT K, SMITH C, *Obes Res* 10 (2002) 315. — 31. BREWIS AA, MCGARVEY ST, JONES J, SWINBURN, BA, *Int J Obes*, 22 (1998) 185. — 32. BAPTISTE-ROBERTS K, GARY TL, BONE LR, HILL MN, BRANCATI FL. *Patient Educ Couns*, 60 (2006) 194. — 33. KUMANYIKA S, GRIER S. *Future Child* 16 (2006) 187. — 34. TROIANO R, FRONGILLO E, JR, SOBAL J, LEVITSKY D, *Int J Obes Relat Metab Disord* 20 (1996) 63. — 35. HODGE A, DOWSE G, COLLINS V, ZIMMET P, *Am J Epidemiol* 143 (1996) 442. — 36. CLARK DO, MUNGA SM, *Am J Epidemiol* 145 (1997) 865. — 37. COOPER R, ROTIMI C, WARD R, *Sci Am* 280 (1999) 56. — 38. THE GUARDIAN UNLIMITED, The land of the fat, available from: <http://education.guardian.co.uk/higher/medicalscience/story/0,,708634,00.html>, accessed December 6, 2006. — 39. CALORIE-LAB, Mississippi repeats as fattest state, Colorado as leanest, available from: <http://calorielab.com/news/2006/08/12/fattest-states-2006/>, accessed December 12, 2006.

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MEĐUKULTURNA PERSPEKTIVA DEBLJINE I ZDRAVLJA U TRI GRUPE ŽENA: CHOCTAW INDIJANKI IZ MISSISSIPPIA, AMERIČKIH SAMOANKI I AFROAMERIKANKI

S A Ž E T A K

Ovo istraživanje uspoređuje debljinu određenu pomoću indeksa tjelesne (BMI) i odnos BMI s visokim krvnim tlakom i dijabetesom kod odraslih žena triju populacija, Choctaw Indijanki iz Mississippija (N=50), američkih Samoanki (N=155), i Afroamerikanki iz zapadne Alabame (N=367). Istraživanja su provedena od ranih do sredine 1990-ih. Sve tri grupe žena imaju visok stupanj prekomjerne tjelesne težine i debljine, najekstremnije izražen kod Samoanki. Iako postoje indikacije da sve tri grupe žena imaju visokokaloričnu prehranu, čini se da je nizak stupanj tjelesne aktivnosti uzrok visoke stope debljine. Prepuštenost negativnom stavu naspram svojih tijela, koje doživljavaju preteškima ili debelima, također može imati ulogu u visokoj stopi debljine. Prevalencije povišenog krvnog tlaka i dijabetesa alarmantno su visoke u sve tri grupe. Postoje, međutim, vrlo različite povezanosti BMI-a, povišenog krvnog tlaka i dijabetesa u tri grupe žena. Samoanke su značajno deblje (i starije), ali imaju niži stupanj povišenog krvnog tlaka od Afroamerikanki i niži stupanj dijabetesa od Choctaw Indijanki. Iako genetički faktori u ove tri populacije zasigurno imaju ulogu u nastanku debljine, također je vjerojatno da BMI 30+, što je uobičajena granica za debljinu, imaju različita značenja u različitim populacijama. Ovi rezultati podupiru ideju o varijacijama odnosa BMI-a i bolesti u različitim populacijama.