

UCLA
Nutrition Bytes

Title

"If You're Hungry, Why Are You Fat?": The Relationship Between Weight and Income Levels

Permalink

<https://escholarship.org/uc/item/08j5s0h0>

Journal

Nutrition Bytes, 6(1)

ISSN

1548-4327

Author

Dossett, Emily

Publication Date

2000

Peer reviewed

Introduction

Public health research has long established a link between being overweight and being low-income. For women in particular, a striking correlation exists between Body Mass Index (BMI) and socioeconomic status (SES). One recent study demonstrated that the two were inversely related, with an average difference between the lowest and highest income groups of about 3.6 BMI units, or approximately 20 pounds. (1) Data from another study illustrates the actual differences between income groups: for women who were food secure, 26% were obese (defined as BMI>29), with an average BMI of 25.6 units. In contrast, individuals who lived in food insecure households were much heavier - 37% of these individuals were obese, with an average BMI of 28.2. (2) Food insecure households are defined as those which "ran out of food, were uncertain about their ability to obtain sufficient food, and were beginning to compromise the quality of the family diet." (2)

This last statement raises a paradox: if households run out of food, compromise quality of their diet, and generally are less nutritionally stable than food secure families, why are they more obese? Wouldn't it seem more logical if the individuals in these families were thin? This theory is borne out as income levels decline to extreme levels of poverty (to 22% obesity and BMI of 25.5 for food insecure individuals), but for moderately low income women, the paradox remains. Thus, while the inverse correlation between BMI and SES is clear, the underlying reasons are poorly understood and many questions remain unanswered.

These questions are not academic only. An elevated BMI is correlated with cardiovascular disease, cancer, and various other diseases. In fact, a difference of about 2 BMI units - a conservative estimate between food secure and insecure households - leads to a 25% increase in risk of death. (3) In terms of public health and public policy, a better understanding how SES and obesity are related could lead to more effective interventions. In other words, if we really knew why low-income people gained more weight, we might be able to design anti-hunger programs in a way that lowered the chances for weight gain. There is a deeper cultural misperception that influences policy also: the question "if you're so hungry, why are you fat?" This paper will explore that question and clarify possible causes for the link between high BMI and low SES.

Which Comes First, the Poverty or the Weight?

Given the relationship between obesity and low SES, which comes first? Let's begin by examining if low SES is possibly causal for obesity. One commonly held assumption is that lower SES is linked to less education, resulting in less knowledge about proper nutrition, exercise habits, and healthy lifestyle. Jeffery and French tackle this assumption, starting from the basic presumption that the "proximal cause [of higher obesity in low SES women] must be differences in diet and exercise habits." (1) (We will look at this presumption more closely later.) Lower income was indeed correlated with lower education levels, with only 24% of women earning \$10-20,000 possessing a college degree, as compared to 40% of those earning \$40,000 or more. Second, lower income women did have a higher percentage of fat intake, mean energy intake, and scored lower on an eating behavior scale. (1) Whether or not less education contributed to these results specifically because such individuals have less knowledge about nutrition is a leap of logic that remains unproven, yet is certainly not illogical.

However, this is not the end of the story. The study revealed three other major differences between income groups - differences linked more closely to culture, behavior, and social support than to education and nutrition alone. First, low income women are less attentive to their weight and more tolerant of weight gain. Women with incomes between \$10-20,000 said that they would have to gain nearly 13.7 pounds before they tried to lose weight, while women above \$30,000 would only have to gain 9.7 pounds. (1) Second, lower income groups perceived less social support from friends as they tried to lose weight. Third, while higher income women had more positive numbers of healthy control practices, low income women did not have more numbers of unhealthy ones. (1) These differences suggest that education level and knowledge about nutrition is not enough to explain SES differences in weight. In fact, the third finding - that low income women do not have more unhealthy diet plans than healthy women - could even be interpreted to mean that both groups have comparable knowledge of what is healthy and unhealthy.

At this point, we need to look at how living a low income lifestyle itself contributes to high BMI. One reason could simply be price. Healthy practices are more expensive than unhealthy ones - i.e., the ingredients for fresh salad cost more than hot dogs. A second reason could be safe places to exercise. Lower income women often live in more violent neighborhoods, making exercise an unsafe activity, while gyms can be an expensive investment. Thus, economic liability and access to a healthy lifestyle is another link between low SES and high BMI. For social, cultural, and economic reasons, then, the significance of income on weight becomes more complicated than correlating it with education and knowledge about nutrition alone.

Who's In and Who's Out?

If cultural norms and economic liability are involved in linking low SES with high BMI, then perhaps these factors can play a role in the other direction as well. In other words, do higher obesity levels lead to lower socioeconomic status? The issue here is discrimination. As Sarlio-Lahteenkorva writes, "Since obesity is negatively valued in affluent societies, it is likely to contribute to social and economic disadvantage; it may increase social discrimination and hamper socioeconomic advancement, whatever the original cause of obesity." (italics mine, 4) Jeffery and French put forth this theory as well: "According to the discrimination hypothesis, lower SES among obese women is driven by social forces that block socioeconomic advancement as a function of obesity." (1)

One recent study tested this theory by examining the links between BMI and unemployment, low income, and social isolation. The results were startling. For women, overweight was associated with current unemployment, and obesity was linked with long-term unemployment. For women who were employed, both categories (overweight and obese) had low individual earnings, with obese women most likely to have low household and individual disposable incomes. Being obese was also correlated with having an absence of close friends outside the family circle, though overweight women did have the highest rates of marriage and least feelings of loneliness. (4)

The question is clearly one of causality. Though the data illustrates a clear link between high BMI, low SES, and social and economic discrepancies, the question of "which came first" remains unclear. Sarlio addresses this point as she writes, "The causal relationship between social status and body weight may be bidirectional: obesity affects social status and vice versa . . . The direction of causality, however, remains an open question in our cross-sectional sample. Overweight and obese women may be downwardly mobile if they face discrimination in the labor market. Another possibility is that low income contributes to the likelihood of obesity." (4) One possibility for further study would be to do a longitudinal study examining when individuals gained weight versus when they became low-income. If women became low income after gaining a substantial amount of weight, the discrimination theory would be further supported. One could also examine whether women who had been overweight or obese since childhood had also always been low income, though this correlation might be more intricately linked to low education levels, healthy lifestyles access issues, and/or biochemical mechanisms - leading to our third and final topic.

How Does Biochemistry Contribute?

The first biochemical link to examine is genetic predisposition. Children in low-income families are usually low-income as well, and BMI at the age of 18 is a major predictor of high BMI throughout life. While there are clearly confounding factors between genetic predisposition and obesity - namely that families tend to eat similar foods and engage in similar levels of activity - there are specific inheritable genes linked to obesity. Twenty Mendelian disorders exhibiting obesity as one of their clinical manifestations have now been mapped. Furthermore, twenty-five human cases of obesity can now be explained by variation in five genes, and the total number of genes, markers, and chromosomal regions that have been associated or linked with human obesity phenotypes continues to increase and is now well above 200. (5) While not all these phenotypes are from inheritable genes, this data proves that a significant proportion of obesity can be traced to family genetic traits.

Yet there is another biochemical link that deserves mention as well: the "weight cycling" theory. This hypothesis states that individuals who eat large amounts of food followed by periods of low caloric intake

tend to gain more weight. The biochemical mechanisms underlying this are not entirely clear and some epidemiological reports disagree with the theory, but small studies done with animals suggest that the body responds to such cycles by increasing fat storage as it has the opportunity, and being more reluctant to lose fat when calories are restricted. (6) While this cycle often thought of as intentional "yo-yo dieting," it may apply to income and weight as well. One example is a case study presented in Pediatrics. A seven year old girl weighing 220% of her ideal body weight was brought to a weight control clinic. It was discovered that the family's caloric intake cycled with the mother's receipt of her welfare check. Since the first check of each month went towards rent, the few days before the second was received were often food-deprived. The examining physician thus noted two possibilities for the daughter's obesity. First, the family ate high-fat foods when food was available. While this theory is most likely, a second possibility is "that obesity may represent an adaptive response to episodic food insufficiency." (7) Working from this second theory, the girl was treated with food supplementation instead of restricting caloric intake (lower-fat foods were substituted as well); the result was 2.3 kg weight loss between clinic visits.

What Does This Mean for Policy?

How can these connections between low SES and high BMI be put to practical use? The answer is twofold: first, anti-hunger programs may be more efficient if they focused on steady food intake instead of crisis intervention. While food pantries, soup kitchens, and other anti-hunger programs meet a significant need, they also are often a "last resort" for families. These families may have been hungry for several days before using such services; this could contribute to "weight cycling" and higher BMI. As Dietz suggests, "Confirmation that obesity is associated with hunger also would suggest that the prevention of obesity in impoverished populations may require increased food supplementation . . . to achieve a more uniform pattern of food consumption." (7) Food stamps and WIC are two public programs that have been designed to provide steady food supplementation, and further exploration regarding their use and its impact on BMI would be helpful.

Second, the larger issue of cultural perceptions of obesity is a more pervasive and difficult topic to address. While anti-discrimination laws have been passed regarding other personal characteristics (age, gender, age, etc), little work has been done regarding obesity specifically. On a deeper level, common misperceptions regarding obesity even affects policy-making itself. Olson observes, "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." (2) Clearly, if hunger is not perceived to be a problem because those who are reportedly hungry look like they are not, the impetus towards addressing hunger issues disappears. As we have seen, the answer to the question, "If you're so hungry, why are you fat?" has very real policy implications, but as yet remains unresolved - therefore deserving further research and consideration for physicians, nutritionists, and policy makers alike.

REFERENCES

1. Jeffery RW, French SA. Socioeconomic status and weight control practices among 20- to 45-year-old women. *Am J Public Health.* 1996; 86(7): 1005-1010.
2. Olson CM. Nutrition and health outcomes associated with food insecurity and hunger. *J. Nutr.* 1999; 129 (2S): 521S-524S.
3. Manson JE, Willett WC, Stampfer MJ, Colditz GA, Hunter DJ, Hankinson SE, Hennekens CH, Speizer FE. Body weight and mortality among women. *N. Engl. J. Med.* 1995; 333: 677-685.
4. Sarlio-Lahteenkorva S, Lahelma E. The association of body mass index with social and economic disadvantage in women and men. *Intl. J. Epid.* 1999; 28: 445-449
5. Chagnon YC, Perusse L, Weisnagel SJ, Rankinen T, Bouchard C. The human obesity gene map: the 1999 update.
6. National Institute of Health web site. What Is Weight Cycling? www.niddk.nih.gov/health/nutrit/pubs/wcycling.htm#whatis.
7. Dietz WH. Does hunger cause obesity? *Pediatrics* 1995; 95: 766-767.

Additional Readings:

Hamelin AM, Habicht JP, Beaudry M. Food insecurity: consequences for the household and broader social implications. *J. Nutr.* 1999; 129 (2S): 525S-528S.

Mela DJ, Aaron JI, Gatency SJ. Relationship of consumer characteristics and food deprivation to food purchasing behavior. *Physio Behav.* 1996; 60 (5): 1331-1335.

Rogers PJ. Eating habits and appetite control: a psychobiological approach. *Proc. Nutr. Soc.* 1999; 58(1): 59-67.

Rose D. Economic determinants and dietary consequences of food insecurity in the United States. *J. Nutr.* 1999; 129 (2S): 517S-520S.