

Relative Weight and Income at Different Levels of Socioeconomic Status

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Obesity is negatively valued in modern societies, and excess weight may have deleterious effects on employment opportunities,¹⁻⁴ income level,^{3,5-7} and social or public relationships in general.^{8,9} Indeed, an inverse relation between weight and socioeconomic status exists in affluent societies, especially in women.¹⁰

Most studies on obesity and social status have used only limited measures of socioeconomic position, such as occupational status, self-reported income, or educational attainment, usually 1 measure at a time.¹⁰ In addition, studies reporting reduced income levels as a result of deviant body weight are so far confined to young overweight women.⁵⁻⁷ Moreover, these studies use self-reported income data, and education or occupation have been used as controlled background variables only. Self-reported income is subject to nonresponse and reporting bias, and this type of approach cannot be used to analyze potentially interesting topics such as subtle weight-related income differences within occupational or educational groups. Some studies suggest that professionals and higher-status people, especially women, have stronger pressures to stay slim,^{11,12} and there is some evidence that obesity may be associated with lower income within occupational groups.^{3,13} However, this issue has not been studied at the population level with reliable data about individual incomes of women and men.

Therefore, we examined how body weight is associated with individual income within educational attainment groups and occupational classes among gainfully employed Finnish women and men. Because obesity is less common but potentially more stigmatizing among those with higher socioeconomic status, especially women, we hypothesized that obese higher-status women might suffer from a particular income disadvantage in their jobs.

Objectives. We examined the association of relative weight with individual income at different levels of socioeconomic status among gainfully employed Finnish women and men.

Methods. We used a population-based survey including 2068 women and 2314 men with linked income data from a taxation register. Regression analysis was used to calculate mean income levels within educational and occupational groups.

Results. Compared with their normal-weight counterparts, obese women with higher education or in upper white-collar positions had significantly lower income; a smaller income disadvantage was seen in overweight women with secondary education and in manual workers. Excess body weight was not associated with income disadvantages in men.

Conclusions. Obesity is associated with a clear income disadvantage, particularly among women with higher socioeconomic status. (*Am J Public Health*. 2004;94:468-472)

METHODS

The data derive from a nationwide Finnish Survey on Living Conditions collected in 1994 by Statistics Finland, the government statistical authorities. The target population of the sample was the Finnish noninstitutional population aged 15 years or older. The data were collected by personal face-to-face interviews ($n=8650$) with a 73% response rate. The nonresponse was largely equally distributed according to age, gender, marital status, region, income, and education. Higher-than-average nonresponses were seen among pensioners older than 75 years, people with unknown occupational status, and men who were on social welfare.^{14,15} However, our study focuses on working-aged 25- to 64-year-old employed women and men only.

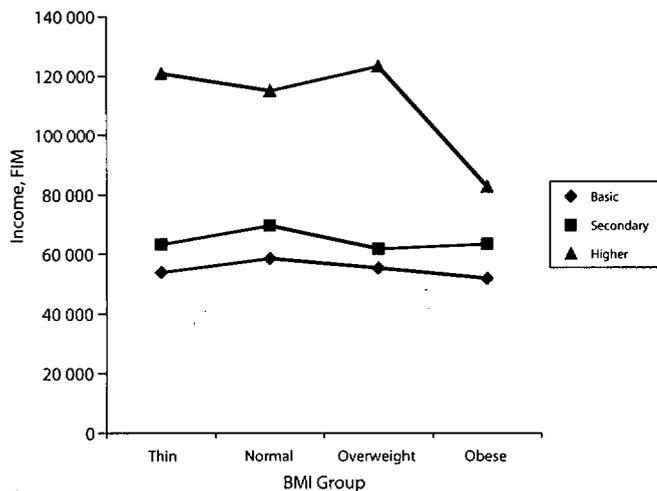
Income data for 1993 were linked to this data set from the Finnish taxation register, which includes data on all transfers and social benefits in 1993. We used a person's own, that is, individual, income data. We excluded people who were not gainfully employed in 1993 or who had received any unemployment or sickness benefits, pensions, or maternity allowances during that year. After these exclusions, our data included 2314 men and 2068 women.

Completed education was obtained from the national register of educational degrees at Statistics Finland and was linked to the survey data. Participants were categorized according to their educational attainment into 3 groups: (1) *higher* (≥ 13 years of education); (2) *secondary* (about 10 to 12 years of education); and (3) *basic* (≤ 9 years of education). Age was categorized into 5-year age groups.

Participants were classified by their current occupational status into 5 classes: (1) *upper white-collar employees*, (2) *lower white-collar employees*, (3) *manual workers*, (4) *farmers*, and (5) *self-employed persons*, including entrepreneurs.

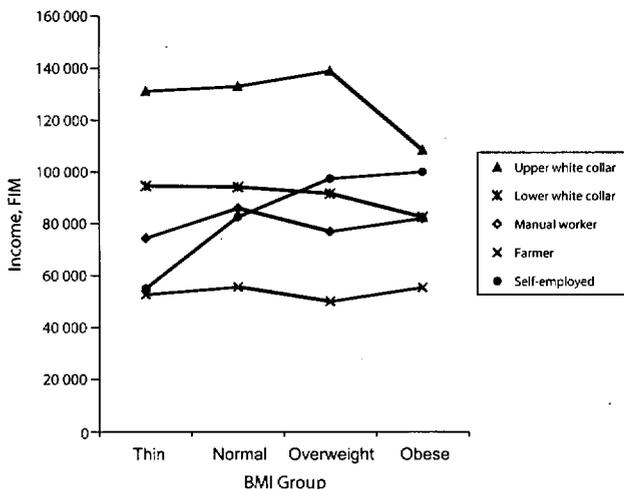
The body mass index (BMI) was calculated using self-reported information on body height and weight (weight in kilograms divided by height in meters squared). Based on their BMI, participants were classified into 4 groups: *thin* ($\text{BMI} < 20 \text{ kg/m}^2$), *normal weight* ($\text{BMI} = 20\text{--}24.9 \text{ kg/m}^2$), *overweight* ($\text{BMI} = 25\text{--}29.9 \text{ kg/m}^2$), and *obese* ($\text{BMI} \geq 30 \text{ kg/m}^2$).¹⁶

We used ordinary regression analysis to calculate the mean income for each weight category within each educational and occupational class and controlled simultaneously for age. We also calculated the mean income within each occupational class and controlled



Note. BMI = body mass index; FIM = Finnish marks. Age adjustment was by regression analysis. The youngest age group (25–29 years) was used as the reference category.

FIGURE 1—Women's age-adjusted annual income, by educational attainment within different BMI groups.



Note. BMI = body mass index; FIM = Finnish marks. Adjustment for age and educational attainment was by regression analysis. The youngest age group (25–29 years) with the highest educational attainment was used as the reference category.

FIGURE 2—Women's age- and education-adjusted annual income, by occupational class within different BMI groups.

simultaneously for age and educational attainment (Figures 1–4). Differences between categories were tested by comparing the regression parameters by means of *t* test. The modeling was carried out with the GLIM statistical package.¹⁷ In the descriptive analyses

(Table 1), the statistical significance of educational and occupational differences between relative weight categories was tested by non-linear χ^2 test and differences in individual income by nonparametric Kruskal–Wallis test in the SAS statistical package.¹⁸ The analyses

were conducted separately for men and women.

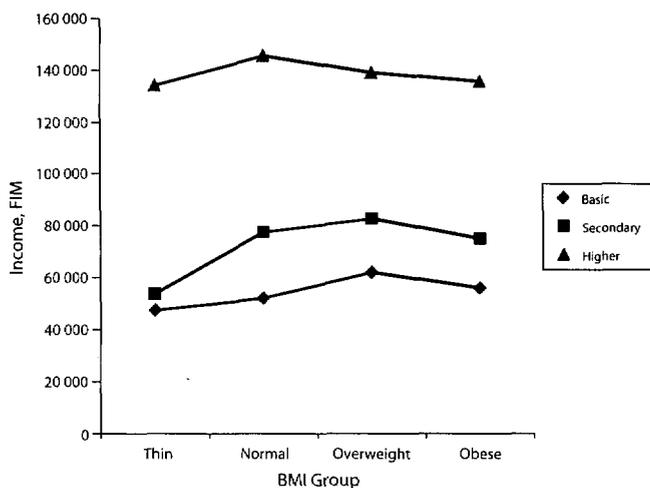
RESULTS

Descriptive data in Table 1 show that educational attainment and occupational class were associated with body size. Overweight and obesity were least common among more highly educated women and men. The obese were underrepresented among white-collar employees, whereas thinness was rare among farmers. Female manual workers had high BMIs, but thinness was common among male manual workers. Unadjusted income data reveal that obese women earned less than other women. There were no weight-related income differences among men, and men had higher income levels than women in all weight categories.

Age-adjusted regression analysis within educational groups showed that obese women with higher education had significantly lower income levels than normal-weight women ($P=.001$), with obese women earning more than \$5000 less each year than other more highly educated women. There was a small income disadvantage for overweight women compared with their normal-weight counterparts among women with secondary education ($P=.0213$). We found no income differences between different BMI groups among women with basic education only (Figure 1).

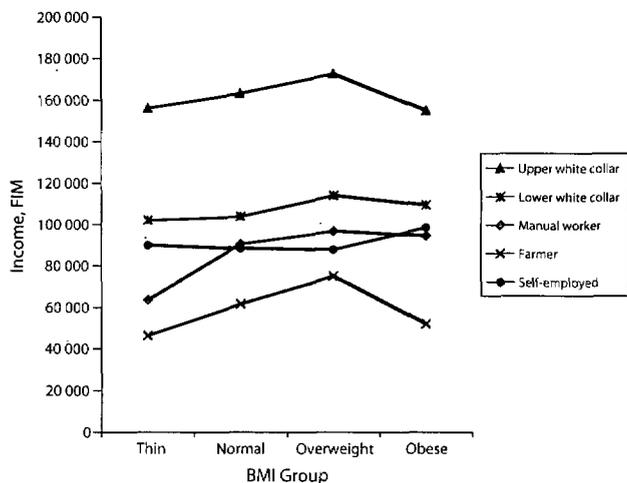
Data on age-adjusted mean income levels within occupational classes showed that obese white-collar women, particularly upper white-collar workers ($P=.0018$) but also to some extent lower white-collar workers ($P=.0104$), earned less than their normal-weight counterparts. This income disadvantage remained when the data were adjusted for educational attainment ($P=.016$ for upper white-collar workers and $.0213$ for lower white-collar workers) in both classes (Figure 2). A small income disadvantage was also found for female manual workers, because those who were overweight had a slightly lower income level than those of normal weight ($P=.0384$). Paradoxically, self-employed thin women had lower income than their normal-weight counterparts.

In contrast to our findings in women, we found no statistically significant association be-



Note. BMI = body mass index; FIM = Finnish marks. Age adjustment was by regression analysis; the youngest age group (25–29 years) was used as the reference category.

FIGURE 3—Men's age-adjusted annual income, by educational attainment within different BMI groups.



Note. BMI = body mass index; FIM = Finnish marks. Adjustment for age and educational attainment was by regression analysis; the youngest age group (25–29 years) with the highest educational attainment was used as the reference category.

FIGURE 4—Men's age- and education-adjusted annual income, by occupational class within different BMI groups.

tween income level and body size within educational (Figure 3) or occupational (Figure 4) classes among men. However, our data suggest that thinness may be associated with income disadvantage in lower educational groups and among male manual workers.

DISCUSSION

This study revealed a clear income disadvantage among obese women within the higher socioeconomic status groups. The association of obesity with individual income

among more highly educated women is especially striking because more highly educated obese women had about 30% lower income levels than their leaner counterparts. Both upper and lower white-collar women showed a similar pattern, even after we controlled for educational attainment. Nevertheless, only obese women in the higher socioeconomic status groups had lower income levels. Women in the lowest educational group had a similar mean income level irrespective of their body weight. Paradoxically, thinness was associated with income disadvantage in self-employed women.

Reasons for these weight-related differences in individual income among women remain open in this cross-sectional study. Although a low income level may promote weight gain,¹⁹ it seems an unlikely explanation for our findings. Obese women in low-income groups had an income level comparable with that of normal-weight women, and even a reverse pattern was seen among self-employed women. A more plausible explanation for our findings might be various forms of discrimination against obese women in higher-status jobs. Negative attitudes toward obese women have been documented, and pressures toward thinness may be strongest in the higher socioeconomic classes.^{4,19,20} Indeed, social variations in the negative attitudes toward obesity can already be found among children, with stronger negative attitudes among those attending schools with high social status.²¹

Discrimination in the labor market is difficult to study, but studies using simulated employment interviews suggest that employers may be less likely to employ overweight women,¹² which may also block these women's socioeconomic advancement in working life. Moreover, it has been reported² that people whose perceptions of their own bodies are central to their self-concept are least likely to hire overweight job applicants. Preoccupation with body size is more common in higher-socioeconomic status groups,^{12,19,22} and therefore employers having a higher social status may also be more prone to discriminate against those with higher body weights.

Obesity-related divergent wage-depressing effects between different occupational sectors

TABLE 1—Educational Level,^a Occupational Class,^a and Income,^b by BMI Group

	BMI <20	BMI 20-24.9	BMI 25-29.9	BMI ≥30	Total	P
Women						
Total % (No.)	9 (186)	53 (1102)	27 (568)	10 (214)	(2070)	
Educational level						.0001
Higher, % (No.)	34 (64)	26 (285)	19 (110)	12 (26)	(485)	
Secondary, % (No.)	48 (89)	50 (556)	47 (267)	44 (94)	(1006)	
Basic, % (No.)	18 (33)	24 (261)	34 (191)	44 (94)	(579)	
Occupational class						.0003
Upper white collar, % (No.)	28 (53)	20 (224)	15 (87)	12 (25)	(389)	
Lower white collar, % (No.)	45 (84)	45 (499)	45 (257)	37 (80)	(920)	
Manual, % (No.)	13 (25)	19 (208)	21 (120)	25 (53)	(406)	
Farmer, % (No.)	3 (5)	6 (65)	9 (53)	13 (27)	(150)	
Self-employed, % (No.)	10 (18)	10 (105)	9 (51)	14 (29)	(203)	
Individual income, FIM	98 744	97 661	93 159	79 609		.0007
Men						
Total % (No.)	2 (34)	42 (972)	45 (1052)	11 (257)	(2315)	
Educational level						.0008
Higher, % (No.)	29 (10)	31 (305)	26 (271)	21 (55)	(641)	
Secondary, % (No.)	56 (19)	45 (441)	43 (449)	41 (105)	(1014)	
Basic, % (No.)	15 (5)	23 (226)	32 (332)	38 (97)	(660)	
Occupational class						.0066
Upper white collar, % (No.)	21 (7)	29 (285)	22 (230)	19 (49)	(571)	
Lower white collar, % (No.)	21 (7)	15 (142)	14 (145)	14 (36)	(330)	
Manual, % (No.)	41 (14)	30 (288)	31 (328)	31 (79)	(709)	
Farmer, % (No.)	3 (1)	12 (114)	14 (150)	15 (38)	(303)	
Self-employed, % (No.)	15 (5)	15 (142)	19 (199)	21 (55)	(401)	
Individual income, FIM	111 470	127 744	126 108	119 737		.4854

Note. BMI = body mass index; FIM = Finnish marks.

^aStatistical significance of educational and occupational differences between relative weight categories was tested by nonlinear χ^2 test.

^bMean annual individual income. Differences in individual income between relative weight categories were tested by nonparametric Kruskal-Wallis test.

are likely to vary, and it seems plausible that obese women face more obstacles than their male counterparts when trying to move across occupational sectors.³ Being aware of the negative attitudes against their body size,^{11,20} obese women may even themselves feel forced to refrain from seeking better-paid jobs. If higher-status obese women have relatively fewer options in the labor market, they may be more likely to accept a lower pay for their job. However, such a disadvantage may not be found in lower-status groups in which obesity is more common and regarded as less deviant and options for well-paid jobs are more limited.

A low income level could also point to reduced productivity due to health-related problems among overweight and obese women. However, this is an unlikely explanation for our findings. Those who had received sickness benefits were excluded, and short-term sickness absence among employees must always be fully covered by employers in Finland. Besides, a clear income disadvantage was seen among more highly educated white-collar women only, although one would expect to see a similar disadvantage among other occupational groups and men as well. Self-employed women showed a positive association between their body size and income

level that may be taken as indirect support for our suggested discrimination hypothesis. Highly qualified obese women might find better job options being self-employed instead of taking a salaried job.

The findings for men were in accordance with previous studies,^{3,5,6,23} and we found no statistically significant associations between body size and income at different levels of socioeconomic status. This suggests that, socioeconomically, obesity is not as stigmatizing for men as it is for women.

The main strength of this nationwide study was the possibility to use register-based data on individual income and education. The data cover the whole Finnish population and lack the potential bias related to commonly used self-reports. It is a limitation that BMI was calculated from self-reported data. It is well known that self-reports underestimate the prevalence of obesity and result in a "flat slope syndrome," that is, obese people tend to underreport their BMI whereas thin people do the reverse.^{24,25} More deviation in both these directions has been found in men's self-reports, whereas women tend to underreport their weight.²⁴ In general, BMI is underestimated in all socioeconomic groups, and the existing studies fail to show a clear socioeconomic pattern in this bias. Some studies have found more underreporting among higher socioeconomic groups,²⁶ whereas others have found more bias in lower socioeconomic groups.²⁴ However, these biases are less pronounced when using face-to-face interviews,²⁵ as in the present study, because the interviewer can react to obvious discrepancies between the observed build and reported values. Except for thin men,²⁴ the effect of self-reported data is likely to be conservative. Our findings suggesting lower income among thin men must be interpreted with caution, but otherwise the socioeconomic pattern found in this study is likely to be rather underestimated than overestimated.

Our study showed a clear income disadvantage among obese women in higher socioeconomic status groups, whereas a similar wage-depressant association with obesity was not found among lower socioeconomic groups. One should note that the public health relevance of this finding is confined to gainfully employed women and men only, be-

cause those outside the labor force were excluded. We also excluded participants who had received sickness or unemployment benefits, maternity allowances, or pensions during the study period. This highlights the importance of our findings to the working life because we could eliminate apparent cases of poor health and people who were outside the labor market. However, it also means that more serious forms of economic problems, such as a higher prevalence of unemployment among obese women,²⁷ remain hidden. These problems may be more prevalent among obese women having low educational qualifications.

Obesity is also a socioeconomic disadvantage in the labor market and at workplaces, and this is particularly true for women. As suggested by our study, obesity may worsen qualified women's labor market performance and their income level. However, this should be confirmed by further longitudinal studies. In any case, attitudes toward the obese should be a concern among the employed as well, and all necessary measures should be taken against weight-related discrimination at workplaces. ■

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Contributors

All authors contributed to the conception, analysis, and interpretation of the study. S. Sarlio-Lähteenkorva drafted the article and was the principal author. K. Silventoinen did all statistical analyses. E. Lahelma contributed to the introduction and drafted parts of the discussion.

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Human Participant Protection

Survey data were collected by governmental Statistics Finland. Participation was voluntary and participants cannot be identified.

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