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Social Ecological Predictors of the Transition to Overweight in Youth:

Results from the Eating for Energy and Nutrition at Schools (TEENS) Study

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Abstract

Objective—To explore the social ecological predictors of the transition to overweight in youth, as shown in results from the Teens Eating for Energy and Nutrition at Schools study.

Design—Longitudinal data from a school-based intervention trial.

Participants—Adolescents who were involved in the Teens Eating for Energy and Nutrition at Schools intervention study who reported a healthful weight at baseline in 1998 (n=1,728).

Main outcome measure—Transition to overweight status (body mass index ≥ 85 th percentile) at follow-up in eighth grade.

Statistical analysis—Generalized linear mixed model regression.

Results—Factors in the social, environmental, individual, and behavioral domains had significant unadjusted relationships with a transition to overweight status. In the multivariate analysis, adolescents who perceived themselves to be overweight at baseline were 2.3 times more likely to be overweight at follow-up compared to those with a normal weight self-perception. Compared to nondieters, current dieters were 2.6 times more likely to be overweight at follow-up, and boys were nearly three times more likely to transition to overweight status at follow-up compared with girls.

Conclusions—Individual factors, primarily related to a self-perception of being overweight, were the strongest predictors of transitioning to overweight as adolescents progressed from seventh through eighth grade. A better understanding of the relationship between weight concern and transition to overweight is needed.

Obesity and overweight in young adulthood are jeopardizing the health of American children. About 16%, or more than 9.8 million, of American children between ages 6 and 19 years are overweight (1). Since the 1970s, overweight among school-aged adolescents has nearly tripled (2), and prevalence continues to rise (3).

Overweight and obesity pose a health threat to children that influences future and current health. Overweight status has been demonstrated to persist into adulthood—80% of children who were overweight between ages 10 and 15 years were obese adults at age 25 years (4). Further, earlier onset of obesity corresponds to earlier onset of adult risk factors associated with cardiovascular disease, such as high blood pressure, high cholesterol, and type 2 diabetes (5). Rates of type 2

diabetes in youth are skyrocketing, bringing both personal costs to families as well as health care costs to the nation related to treating youth with diabetes (6).

We know very little about what is causing the obesity epidemic. At the most basic level, overweight results from an imbalance between the energy consumed as food and beverages and the energy used to support normal growth and development, metabolism, and physical activity. With regard to diet, a recent review of research on childhood overweight and obesity concluded that the association between dietary factors and obesity in children is not consistent (3). Numerous guidelines regarding obesity prevention in childhood emphasize taking a comprehensive approach to support healthful lifestyle changes, including dietary changes, physical activity, and a nurturing environment (7-12).

To improve on our understanding of the complexity of childhood overweight and obesity, an ecological framework has been proposed as the most comprehensive approach for examining the myriad factors at multiple levels that might be contributing to childhood obesity (6,13). This framework suggests that individual factors (including genetic predisposition, taste preferences, beliefs, and attitudes), behavioral factors (including foods chosen and choices about sedentary and active time), the social environmental (including family, peer, and cultural messages about eating and activity preferences), and the physical environmental (access to foods and activity options) may all be influential in one's ability to maintain a healthful weight over time (14).

The literature on childhood overweight and obesity is dominated by articles reporting on correlates of childhood overweight and obesity. There is limited research that examines the temporal relationship between individual, behavioral, social environmental, and physical environmental factors and development of overweight and obesity (15-17). Our study builds on the previous research by using a longitudinal cohort design and an ecological framework to examine potential predictors of transitioning from a healthful weight to an overweight category during adolescence. Predictors examined are from the individual, behavioral, and social environmental levels.

METHODS

Study Design and Population

Data for our analyses are from baseline and follow-up surveys for the Teens Eating for Energy and Nutrition at Schools (TEENS) study, a randomized school-based nutrition intervention trial for middle-school students and their families. TEENS was conducted in 16 middle schools in the metropolitan area of Minneapolis and St Paul, Minnesota, and was designed to evaluate school-environmental, classroom, and family interventions to increase fruit and vegetable consumption and decrease fat intake by seventh and eighth graders to reduce future risk of cancer. Classroom components included behavior-based nutrition education lessons, individual skill development for behavior change (eg, goal setting and self-monitoring), behavior modification, and a collaborative nutrition project. The family component included family packets with newsletters and behavioral strategies and the environmental component focused on developing school nutrition councils and working with school foodservice to improve choices on a la carte lines. Theoretical framework and detailed study description are described elsewhere (18-21). Results suggest environmental changes in the TEENS schools, some dietary changes at the end of the first year, but no significant dietary changes by the end of the intervention period (19,20,22).

This research uses data from the classroom surveys only. Classroom surveys were completed at baseline (seventh grade) and follow-up (eighth grade) using the same survey instrument at each time point; all students in the grade level at the school were invited to participate in the

survey. The baseline survey was self-administered in fall 1998 with trained survey staff present during administration, with more than 95% of eligible students completing the survey (n=3,878). In spring 2000, the follow-up survey was completed with 93% of the original sample (n=3,588). The study was reviewed and approved by the University of Minnesota Institutional Review Board for the protection of human subjects.

Measures

The main outcome variable in this analysis was a transition to overweight status from a healthy weight at baseline. Body mass index (BMI) was calculated from self-reported height and weight using the standard metric formula (kg/m^2) collected at baseline and follow-up. Overweight status based on BMI percentile was identified using age- and sex-specific reference data from the Centers for Disease Control and Prevention (22): under-weight (BMI <5th percentile), normal weight (BMI $\geq$ 5th percentile but <85th percentile), and overweight (BMI $\geq$ 85th percentile) (23). For this study, we classified students at or above the 85th percentile as overweight and did not make a distinction between at-risk and overweight.

Fifty percent of teenagers in the study provided a self-report of BMI both at baseline and follow-up (n=2,310) that met our inclusion criteria for reasonable height and weight data. At baseline, students categorized as overweight (n=248) or underweight (n=116) were excluded. At follow-up, students who became underweight (n=68) were excluded. The final sample size of students at a normal weight at baseline that provided BMI data at both baseline and follow-up surveys was used in these analyses (n=1,728). Students were dichotomized into transitioning to the overweight category (yes/no) based on BMI percentile at follow-up.

Variables examined as potential predictors of transitioning to overweight included baseline measures of the individual, behavioral, and social environmental domains. The individual domain was assessed using four scales: valuation of health appearance and achievement (seven items), outcome expectations concerning healthful eating (seven items), spiritual beliefs in health behaviors (six items), and depression (20 items). Other items in the individual domain included dieting (one item) and perceived weight status (one item). Dieting was assessed with a single item, "Which of the following are you trying to do?" (lose weight, gain weight, stay the same weight, or I am not trying to do anything about my weight.) Self-perception of weight status was assessed with a single item, "How do you think of yourself?" (very underweight, slightly underweight, about the right weight, slightly overweight, or very overweight.)

In the behavioral domain, scales included a physical activity index (two items), assessment of current eating behavior (four items), sedentary behavior scale (four items) and usual eating pattern scale (nine items). Weight control behavior was assessed using a single item: "During the past 30 days, did you do any of the following things to lose weight or to keep from gaining weight?" (None, dieted, exercised, made yourself vomit, took diet pills, took laxatives/diuretics, or skipped meals.) Smoking and alcohol were assessed with a single item of past 30-day prevalence for each separate behavior. Predictor variables representing the social environmental domain were assessed using four scales: barriers to healthful eating (six items), authoritative parenting (mother: six items, father: six items), subjective norms (six items) and outlook for the future (four items). The psychometric properties of scales had test-retest and Cronbach's α reliabilities that were assessed mostly at .60 or higher; detailed description of scales and items used in the TEENS study are provided elsewhere (24).

Several covariates were included in the models including self-reported race/ethnicity, socioeconomic status (SES), and treatment status. SES was assessed by including the following variables dichotomized as yes/no: two-parent household, participation in the free or reduced lunch program, full-time parental employment status, and parental educational attainment of greater than high school. Intervention condition was included in the analysis to account for any

treatment effects of the TEENS study (intervention or control), although the TEENS intervention was not found to have any effect on change in BMI. Further, measures of dietary intake were not statistically significantly different based on randomization to condition; despite these null findings, intervention was included in the analysis to account for randomization to condition. Consistent with the purpose of predicting transition to overweight, baseline values for the covariates were used in the regression model to predict the outcome.

Statistical Analysis

To account for the extra variation caused by sampling schools within our group-randomized study design, we used a mixed regression model (25). In addition, we used generalized linear mixed regression to model the dichotomous outcome, to account for multiple sources of random variation, and because we cannot assume that individual-level errors were normally distributed. The GLIMMIX procedure was used for the primary analyses, and all analyses were conducted using Version 9.1.3 of SAS (2000, SAS Institute Inc, Cary, NC) (26). The dependent variable was drawn from the follow-up data, and all predictors were drawn from the baseline data.

Each predictor variable was separately regressed on outcome to determine if there was an association between these variables from the three domains and the transitioning to an unhealthful weight. Using a conservative approach, all significant predictors with a *P* value at the 0.10 level or below were included in the final model. This cutpoint allows for covariates with lower sample size or power to be considered in the final model; statistical significance in the final model required a *P* value of 0.05. Odds ratios from the final model provide the probability of transitioning to the overweight category from a normal weight, compared to students who remained at a normal weight in the final model, adjusted for potential confounding effects of SES, race, and intervention condition.

RESULTS

Ten percent of our sample of adolescents ($n=180$) moved from a normal weight to the overweight category between seventh and eighth grades, as shown in the Figure. A description of the sample characteristics at baseline is shown in Table 1 for the entire sample, and stratified by sex. The mean age of students in the sample at baseline was 12.8 years, with an even distribution of boys and girls. The majority (76%) of students self-reported white race. Most students lived with both parents (77%), and 18% participated in the free or reduced-price lunch program. At baseline 17% of the sample thought that they were slightly or very overweight. Twenty-one percent of girls and 13% of boys self-reported a perception of slightly or very overweight and 35% of girls and 18% of boys reported trying to lose weight. Only 1% of the sample reported any unhealthful weight loss practices in the past month, including using diet pills, vomiting, laxatives, or diuretics to lose weight. Approximately 6% reported smoking cigarettes in the past month, and 14% of the sample reported alcohol use in the past month. The mean hours per week for physical activity and sedentary behaviors were 6 and 11, respectively, with boys reporting more physical activity hours than girls (5.9 vs 5.7 hours/week), and slightly more sedentary behavior (12.2 vs 9.9 hours/week). The mean depression score was 12.1 (12.9 for girls, 11.3 for boys); a score of 16 or higher indicates depressive symptomology (26).

The unadjusted analyses of all predictor variables from seventh grade are provided in Table 2, both for the entire sample and stratified by sex. From the social environmental domain, having an optimistic future outlook was a significant protective factor against transition to being overweight. From the individual domain, being a boy, perceiving that one is overweight, reporting trying to lose weight, and higher levels of reported depression were predictive of a transition to an unhealthful weight status. From the behavioral domain, low levels of physical activity and past month alcohol use were significant predictors of transitioning to an unhealthful

weight. There were some significant predictors that differed between boys and girls in the unadjusted analysis. Self-perception of being overweight and trying to lose weight were both significant predictors for boys and girls. In the unadjusted analysis, having an engaged but not controlling mother (authoritarian) was found to be protective for maintaining a healthful weight in girls but not boys. An optimistic future outlook was also a significant protective factor for becoming overweight for girls, but not boys. Past month alcohol use and a higher score on depressive symptoms increased the risk of becoming overweight for boys but not girls.

Table 3 shows the final model adjusted for SES, race, and treatment condition and is presented for the total sample and stratified by sex. Variables that had a statistically significant relationship with the dependent variable in the total sample or in one sex were examined in the adjusted model. After adjusting for SES, race, and treatment condition, the only variables that remained statistically significant predictors of transitioning into overweight status were: being a boy, a self-perception of being overweight at baseline, and trying to lose weight at baseline. All results are reported as adjusted by all other factors in the model. Boys were nearly three times more likely to transition to overweight status compared to girls in the adjusted analyses. Students who perceived their weight at baseline as slightly or very overweight (despite being at a normal weight) had 2.3 times greater odds of becoming overweight by eighth grade, compared to students with a self-perception of normal weight status. Trying to lose weight at baseline was a significant predictor of becoming overweight at follow-up. Students who reported currently trying to lose weight were 2.7 times more likely to gain weight than other students who were not trying to lose weight.

Evaluating the sex differences in the final adjusted model, trying to lose weight was the only statistically significant predictor of future transition to overweight in both boys and girls. Boys who were trying to lose weight at baseline were 2.9 times as likely to gain weight at the follow-up measures as compared to boys who were not trying to lose weight at baseline; for girls, those who were trying to lose weight at baseline were 2.3 times as likely to transition to an overweight status at follow-up compared with girls not trying to lose weight. Girls who thought they were overweight at baseline were 3.6 times as likely to gain weight at follow-up compared with girls who didn't think they were overweight and boys were nearly three times as likely to transition to an unhealthy weight status at follow-up compared with girls. In addition, boys with higher levels of depressive symptoms at baseline were more likely to transition to an unhealthy weight at follow-up compared with boys with lower level of depressive symptoms.

In an attempt to better understand why healthful weight students who express concern about their weight are more likely to transition to an unhealthy weight, we did post hoc analyses that further restricted our baseline sample to youth who were in the fifth to 74th percentiles for BMI. Our rationale was that it was possible that youth in the 75th to 84th percentiles for BMI were on the cusp of becoming overweight or were getting messages that they might be headed toward an unhealthy weight and, therefore, sensitized to the possibility of gaining weight. The restricted sample included 1,456 youth (Table 4). All the baseline predictors that were significant in the unadjusted model were examined as potential predictors. In the restricted sample, the three variables that remain statistically significant for predicting transition to an unhealthy weight were: being a boy (odds ratio 2.7, 95% confidence interval 1.6 to 4.7), self-perception of being overweight (odds ratio 2.9, 95% confidence interval 1.7 to 5.0), and trying to lose weight (odds ratio 2.7, 95% confidence interval 1.6 to 4.7). Therefore, this analysis suggests that even in youth who are less than the 75th percentile and have weight concerns are more likely to transition to gaining unhealthy amounts of weight over time.

DISCUSSION

Our findings suggest that, after controlling for possible confounding variables, the only statistically significant predictors of a transition to overweight were from the individual domain and focused on beliefs about being overweight and trying to lose weight. Clearly, we need to understand why normal-weight students who perceive themselves as overweight and are trying to lose weight are more likely to transition to being overweight over time. Our findings are consistent with other longitudinal studies that have documented a trend toward transition to overweight in students who try to lose weight, particularly in adolescents who use unhealthful methods to lose weight (27-29). In particular, Neumark-Sztainer and colleagues (30) found associations between dieting and later onset of eating disorders and that dieters had twice the risk of becoming overweight as nondieters. Stice and colleagues (16) confirmed this relationship prospectively in girls, as radical weight control behaviors were associated with obesity onset, although depressive symptoms were not associated with obesity onset. In addition, binge eating may predispose children excess gain in fat mass (up to 15%) compared to children who did not report binge eating, after controlling for depressive symptoms (17).

Although the direction of the association between unhealthful weight practices and transition to overweight obesity was consistent with other prospective research, it should be noted that students in our sample reported a notably lower level (1%) of past month use of unhealthful weight control behavior compared to estimates of 25% of adolescents in other studies (31, 32). It is possible that unhealthful weight control behaviors were underreported in this sample, especially given the degree of concern expressed for self-reported overweight. Given the importance of these results, future studies may wish to include additional items to measure unhealthful weight control behaviors (a single item was used here).

We were surprised to find the increased risk for boys to gain weight. Due to the small number of students who were defined as overweight at follow-up, our study did not have the power to fully explore effect modification by sex. Because the levels of depression were higher in boys vs girls, it may be possible that side effects from depression treatment (medications) could contribute to weight gain, although this study did not collect medication data. Further work on the relationship between depression, sex, and overweight status is needed.

This study is not without limitations. The variables considered were all based on self-report measures from youth. However, self-reported height and weight has been validated and used in other studies of adolescent health (33). Further, when validity and reliability have been assessed in diverse samples of adolescents, the values were highly reliable for categorizing overweight and obese categories, but may underestimate prevalence due to discrepancies with actual height and weight measures (34,35). The majority of the scales and individual survey items have been validated for use in adolescents, which provides greater confidence in the accuracy of the results (24). The role of the physical environment, including home, school, and neighborhood environments were not included in this study, and should be evaluated in the future to more completely test an ecological model. The students in this study were primarily white from an urban center, so the results have limited external validity.

This study adds to the limited literature on predictors for the becoming overweight during a critical developmental period in adolescence. The prospective nature of these data provides an important contribution to eliminate concerns regarding the causal relationship between predictors and the primary outcome.

CONCLUSIONS

These findings help to confirm the temporal association between certain social, environmental, individual, and behavioral factors that contribute toward the development of overweight and

obesity in adolescents. More information is needed to better understand how self-perceptions of being overweight and trying to lose weight may affect an unhealthful weight gain. Future studies should examine factors that may be moderating and mediating the relationship between self-perception, dieting attempts and transition to overweight. As the understanding of these relationships improves, interventions may be developed to improve individual-level self-perception of weight and promote healthful attitudes and behaviors toward maintaining a healthful weight. Using an ecological approach, interventions designed to promote support for healthful eating and activity behaviors in the social and physical environments in which youth participate are also needed. Food and nutrition professionals are uniquely qualified to apply findings to help to promote primary prevention of adolescent overweight.

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Figure.

Change in weight from seventh to eighth grade: The Teens Eating for Energy and Nutrition at Schools (TEENS) study (n=1,728). ^aBMI=body mass index.

Table 1

General characteristics of a sample of normal-weight^a seventh-grade students participating in the Teens Eating for Energy and Nutrition at Schools (TEENS) study, by sex

Baseline (seventh grade) characteristics	Total (n 1,728)	Boys (n 862)	Girls (n 866)
	←mean ± standard deviation→		
Age (y)	12.8±0.35	12.8±0.38	12.7±0.32
	←n (%)→		
Race/ethnicity			
Hispanic or Latino	26 (2)	14 (2)	12 (1)
White	1,321 (76)	651 (76)	670 (77)
Black or African American	105 (6)	63 (7)	42 (5)
Asian	102 (6)	43 (5)	59 (7)
American Indian or Alaskan Native	18 (1)	9 (1)	9 (1)
Other	93 (5)	44 (5)	49 (6)
Two-parent household	1,331 (7)	659 (76)	672 (78)
Free/reduced-price lunch	309 (18)	165 (19)	144 (17)
Self-perception of weight			
Very underweight	45 (3)	29 (3)	16 (2)
Slightly underweight	301 (17)	163 (19)	138 (16)
About the right weight	1,077 (63)	555 (65)	522 (61)
Slightly overweight	275 (16)	107 (12)	168 (19)
Very overweight	24 (1)	6 (1)	18 (2)
Currently trying to lose weight	461 (27)	157 (18)	304 (35)
Unhealthful dieting practices^b	16 (1)	5 (<1)	11 (1)
Past month smoking	106 (6)	48 (6)	58 (7)
Past month alcohol use	234 (14)	128 (15)	106 (12)
	←mean ± standard deviation→		
Sedentary behavior (hr/wk)	11.1±3.2	12.2±3.2	9.9±2.7
Physical activity (hr/wk)	5.8±2.8	5.9±2.9	5.7±2.8
Depression score	12.1±9.1	11.3±8.3	12.9±9.8

^a Defined as body mass index between 5th and <85th percentile.

^b Defined as any past 30 days use of diet pills, vomiting, laxatives, or diuretics.

Table 2

Unadjusted associations between seventh grade predictors^a and overweight status during eighth grade, for participants in the Teens Eating for Energy and Nutrition at Schools (TEENS) study, by sex (n = 1,728)

Predictors from seventh grade	Overall	Boys	Girls
←Odds ratio (95% confidence interval)→			
Social environmental domain			
Barriers to healthful eating	1.00 (0.96-1.04)	1.02 (0.97-1.07)	0.99 (0.93-1.05)
Authoritarian mother	0.96 (0.91-1.01)	0.98 (0.92-1.05)	0.91 (0.85-0.99)*
Authoritarian father	0.99 (0.94-1.03)	0.99 (0.94-1.06)	0.95 (0.89-1.03)
Optimistic future outlook	0.92 (0.86-0.98)*	0.97 (0.89-1.05)	0.87 (0.78-0.96)*
Subjective norms on healthful eating	1.01 (0.98-1.04)	1.02 (0.91-1.06)	1.00 (0.95-1.05)
Individual domain			
Being a boy	2.00 (1.45-2.76)*	—	—
Self-perception of being overweight	3.75 (2.70-5.23)*	3.64 (2.29-5.77)*	5.77 (3.39-9.81)*
Trying to lose weight	3.17 (2.31-4.34)*	3.70 (2.42-5.65)*	4.83 (2.76-8.45)*
Symptoms of depression	1.03 (1.01-1.05)*	1.05 (1.02-1.07)*	1.02 (1.00-1.05)
Outcome expectations for healthful eating	0.99 (0.96-1.01)	0.99 (0.96-1.02)	0.99 (0.95-1.03)
Valuation of health	1.02 (0.98-1.05)	1.01 (0.97-1.06)	1.02 (0.96-1.08)
Spirituality	1.02 (0.98-1.07)	1.02 (0.9-1.08)	1.04 (0.96-1.12)
Behavioral domain			
Level of physical activity	0.94 (0.89-0.99)*	0.94 (0.88-1.01)	0.93 (0.85-1.01)
Sedentary behavior (h/wk)	1.03 (0.98-1.08)	0.99 (0.93-1.05)	1.00 (0.91-1.10)
Past month smoking	0.89 (0.45-1.74)	0.73 (0.28-1.88)	1.22 (0.47-3.17)
Past month alcohol use	1.58 (1.06-2.36)*	2.05 (1.27-3.30)*	0.74 (0.31-1.76)
Fruit and vegetable consumption	0.99 (0.95-1.04)	1.01 (0.96-1.06)	0.96 (0.88-1.05)
Pattern of usual dietary choices	0.99 (0.92-1.07)	1.06 (0.97-1.17)	1.00 (0.89-1.13)
Unhealthful weight loss methods	1.23 (0.28-5.47)	NA ^b	2.89 (0.61-13.74)

^aBased on data collected from classroom surveys. Detailed description of scales and items used in the TEENS study are provided elsewhere (24).

^bNA = not applicable. The sample size was too small for analysis.

* $P < 0.05$.

Table 3

Predictors of becoming overweight during eighth grade^a, based on data collected as part of the Teens Eating for Energy and Nutrition at Schools (TEENS) study (n = 1,728)

Predictors from baseline (seventh grade)	Overall	Boys	Girls
	←Odds ratio (95% confidence interval)→		
Social environmental domain			
Optimistic future outlook	1.01 (0.93-1.10)	1.07 (0.96-1.18)	50.89 (0.77-1.02)
Authoritarian mother	1.00 (0.94-1.05)	1.02 (0.95-2.69)	0.94 (0.86-1.03)
Individual domain			
Being a boy	2.98 (2.09-4.26)*	—	—
Self-perception of being overweight	2.28 (1.49-3.49)*	1.68 (0.92-3.08)	3.62 (1.87-7.02)*
Trying to lose weight	2.61 (1.73-3.95)*	2.90 (1.69-4.97)*	2.43 (1.22-4.84)*
Symptoms of depression	1.02 (1.00-1.04)	1.04 (1.02-1.07)*	0.98 (0.94-1.00)
Behavioral domain			
Level of physical activity	0.95 (0.89-1.00)	0.96 (0.89-1.04)	0.95 (0.86-1.04)
Past month alcohol use	1.15 (0.72-1.84)	1.65 (0.92-2.95)	0.50 (0.19-1.28)

^a Adjusted for socioeconomic status variables, race, and intervention condition. Detailed description of scales and items used in the TEENS study are provided elsewhere (24).

* $P < 0.05$.

Table 4

Predictors of becoming overweight during eighth grade^a among boys and girls in the fifth to 75th percentiles for body mass index (n=1,456) in the Teens Eating for Energy and Nutrition at Schools (TEENS) study (n=1,456)

Overall	
Predictors from baseline (seventh grade)	Odds ratio (95% confidence interval)
Social environmental domain	
Optimistic future outlook	1.01 (0.91-1.12)
Authoritarian mother	0.99 (0.92-1.07)
Individual domain	
Being a boy	2.64 (1.64-4.24)*
Self-perception of being overweight	2.88 (1.65-5.04)*
Trying to lose weight	2.70 (1.56-4.67)*
Symptoms of depression	1.01 (0.99-1.04)
Behavioral domain	
Physical activity	0.94 (0.88-1.02)
Past month alcohol use	1.58 (0.88-2.81)

^a Adjusted for socioeconomic status variables, race, and intervention condition. Detailed description of scales and items used as predictors in the TEENS study are provided elsewhere (24).

* $P < 0.05$.