HHS Public Access

Author manuscript

Obesity (Silver Spring). Author manuscript; available in PMC 2014 March 01.

Published in final edited form as:

Obesity (Silver Spring). 2013 September ; 21(9): E428–E434. doi:10.1002/oby.20092.

Weight-Related Teasing from Adolescence to Young Adulthood: Longitudinal and Secular Trends between 1999 and 2010

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Abstract

The purpose of this study is to examine longitudinal trends from 1999–2010 in weight-related teasing as adolescents transition to young adulthood and to examine secular trends in teasing among early and middle adolescents over the same time period. To examine longitudinal changes we used data from 2,287 participants in Project EAT-III, an ongoing cohort that followed two age cohorts of adolescents from 1999 to 2010. Over the study period the younger cohort transitioned from early adolescence to early young adulthood and the older cohort transitioned from middle adolescence to middle young adulthood. To examine how levels of teasing among early and middle adolescents changed from 1999–2010 (secular trends), we compared baseline data from EAT-I to cross-sectional data from a new cohort of early and middle adolescents that was established in 2010. In 1999, 29% of early adolescent and 23% of middle adolescent females reported being teased. Approximately 18% of males in both age groups reported being teased in 1999. Longitudinal trends suggest that weight-related teasing remained stable among all subgroups as they transitioned to young adulthood, except among early adolescent males where teasing increased to 27% in early young adulthood. Analyses of age-matched secular trends show that teasing decreased by 10.4% among early adolescent females and by 7.6% among middle adolescent males from 1999–2010. Results suggest that interventions that focus on reducing weight-based discrimination are needed throughout adolescence and young adulthood. The secular decrease in weight-related teasing is promising, but the high prevalence of teasing remains a public health concern.

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Disclosure Statement

The authors have no conflicts of interest to disclose.

Introduction

Being teased about one's weight has been shown to be associated with body dissatisfaction, low self-esteem, depressive symptoms, and disordered eating behaviors (1–3). Numerous studies have demonstrated that being teased about one's weight is common among adolescents and that overweight and obese adolescents experience higher rates of weight-related teasing than their average weight peers (4, 5). Limited data are available on the prevalence of weight-related teasing among young adults and how the prevalence of weight-related teasing changes from adolescence to young adulthood. In 2008, our research team published the first study to examine how the prevalence of weight-related teasing changed through adolescence (6). Using five-year follow-up data from Project EAT II, an ongoing cohort study, we found that the prevalence of weight-related teasing remained relatively stable for most youth as they transitioned from early adolescence (middle school) to middle adolescence (high school) and from middle adolescence to late adolescence (post high school)(6). However, overweight males and females reported increasing levels of being teased about their weight as they transitioned from early adolescence to middle adolescence (6).

What remains unknown is how the prevalence of weight-related teasing changes as adolescents transition to young adulthood. The nature of social relationships and developmental processes in young adulthood differs from those in adolescence (7,8). Prevalence of weight-related teasing may also differ as adolescents transition to young adulthood. Our study helps address this knowledge gap by examining prevalence of weight-related teasing changes from adolescence to young adulthood. Identifying how the prevalence of weight-related teasing changes across these life stages can inform appropriate timing of interventions to reduce weight-related bias and discrimination.

In addition, little is known about how the prevalence of weight-related teasing has changed over time (secular trends). Using EAT-II data we compared the prevalence of weight-related teasing among middle adolescents in 1999 to the rates of teasing among the same age group in 2004 and found that frequency of weight-related teasing remained stable among most adolescent subgroups, but declined among overweight males (6). The Health Behavior in School-Aged Children study examined secular trends (1997–2006) in bullying behavior, not specific to weight, among U. S. adolescents and found that bullying rates remained stable among females and decreased among males over the study period (9). A second study examined secular trends in perceived weight/height discrimination among American adults aged 35–74 and found that weight/height discrimination increased from 1995 to 2006 (10). Our study will build upon this previous research by examining secular trends specific to weight-related teasing from 1999 to 2010 among both early and middle adolescents. Exploring secular trends in teasing may provide insight into whether weight-related norms and biases have changed over a period when media and research attention focused on obesity has increased (11).

The objective of this study was to examine longitudinal and secular trends from 1999 to 2010 in weight-related teasing among an ethnically diverse sample of adolescents and young adults. Specifically, this study sought to answer two questions. The first question was how

does weight-related teasing change among females and males as they progress from adolescence to young adulthood? Our research team collected 10-year longitudinal data on EAT participants (EAT-III) allowing us to examine longitudinal trends as adolescents transition to young adulthood. We hypothesized that the prevalence of weight-related teasing would decrease as participants transitioned from adolescence to young adulthood. Compared to being in high school or college, we would expect that young adults would have greater control over whom they interact with socially, which may allow them to limit contact with individuals who may tease them about their weight.

The second research question we examined was whether there was a secular change in the prevalence of weight-related teasing among male and female early and middle adolescents during 1999 to 2010? Our research team recently collected data from a new cohort of both early and middle adolescents (EAT 2010) allowing us to conduct a repeated cross-sectional study using baseline data from EAT-III to the EAT 2010 data to examine how the prevalence of weight-related teasing has changed from 1999 to 2010 among both early and middle adolescents. Given the conflicting results of the few studies that have examined secular changes in bullying (9) and weight-based discrimination (10), we tentatively hypothesized that, as we saw with our five-year results (6), the prevalence of weight-related teasing would remain high and relatively unchanged among both early and middle adolescents from 1999 to 2010.

Methods

Trends in weight teasing were examined among participants in Project EAT (Eating and Activity in Teens and Young Adults), a unique set of studies with longitudinal and repeated cross-sectional components. Project EAT was designed to assess variables of relevance to eating behaviors, physical activity patterns, and weight-related outcomes in adolescents and young adults. Data collected in 1998–1999 (EAT-I) and 2009–2010 (EAT-III) on a longitudinal cohort, and data collected from a new cohort of adolescents in 2009–2010 (EAT 2010), were utilized for the current analysis. The sample and data collection for each study component are described below. Study procedures for each wave were approved by the University of Minnesota's Institutional Review Board Human Subjects Committee and by the research boards of school districts that participated in EAT-I and EAT 2010.

Longitudinal trends

The longitudinal analytic sample included 1030 young men and 1257 young women. One third of participants (29.9%) were in the younger cohort; at baseline (1998–1999) they were in early adolescence (mean age = 12.8±0.7 years) and at follow-up (2009–2010) they were in early young adulthood (mean age = 23.2±1.0 years). Two thirds of participants (70.1%) were in the older cohort; at baseline they were in middle adolescence (mean age = 15.9±0.8 years) and at follow-up they were in middle young adulthood (mean age = 26.2±0.9 years).

At baseline (EAT-I), 4,746 junior and senior high school students at 31 public schools in the Minneapolis/St. Paul metropolitan area completed in-class surveys and anthropometric measures (12, 13). At the 2009–2010 follow-up (EAT-III) participants were mailed letters inviting them to complete online or paper surveys. Data were also collected and reported at

five-year follow-up (6), but are not included in the current analysis in order to focus on long-term changes in weight-related teasing during the transition to adulthood.

For the 2009–2010 follow-up (EAT-III), survey data were collected from 66.4% of those for whom correct contact information was available, representing 48.2% of the original cohort. Statistical adjustments were made to account for attrition (see statistical analysis section). The final weighted sample was 48.4% white, 18.6% African American, 19.6% Asian, 5.9% Hispanic, 3.3% Native American, and 4.2% mixed or other race/ethnicity and was well-distributed across five levels of socioeconomic status (SES): low (18.0%), middle-low (19.0%), middle (26.2%), middle-high (23.3%) and high (13.5%). The socio-demographic characteristics of the EAT-1, EAT-III, and EAT 2010 sample are provided in Table 1. Additional details of the study design have been reported elsewhere (14, 15).

Secular trends

The repeated cross-sectional analytic sample includes 3,072 adolescents from EAT-I and 2,793 adolescents from EAT 2010. For EAT 2010, a multi-level study of factors associated with weight-related outcomes, a new cohort of adolescent participants was again recruited from public schools (n=20) in the Minneapolis/St. Paul metropolitan area of Minnesota. To facilitate the examination of secular trends, the EAT-I study sample was restricted to 27 schools from the two urban school districts that participated in both EAT-I and EAT 2010. Statistical adjustments were made to account for differences in the samples (see statistical analysis section). In both EAT-I and EAT 2010, samples of early and middle adolescents were included. Mean ages and standard deviations (SD) of participants in early adolescence were 12.8 (SD=0.82) and 12.6 (SD=0.83) for EAT-I and EAT 2010, respectively. Mean ages of participants in middle adolescence were 16.0 (SD=0.90) and 16.0 (SD=1.29) for EAT-I and EAT 2010. At each wave, approximately 90% of adolescents who were at school on the days of survey administration had parental consent and chose to participate.

Measures

Adolescent participants in EAT-I and EAT 2010 completed surveys in school classrooms and mailed paper or online surveys were completed by young adult participants in EAT-III; all survey questions utilized in the current analysis were identical at each study wave. Survey development for each wave involved assessments of test-retest reliability. Similarly good agreement was found for the survey questions of interest here in a sample of 161 diverse adolescents who pilot-tested the EAT-I survey in 1999 and a separate sample of 66 young adults who pilot-tested the EAT-III survey in 2008 (12, 16). In 2010, we again examined the test-retest reliability of survey questions in 129 diverse adolescents; psychometric properties from 2010 are reported in this paper.

Weight-related teasing

Frequency of weight-related teasing was assessed with the item ‘How often did any of the following things happen to you: You are teased about your weight.’ Response categories were: 1) never; 2) less than once a year; 3) a few times a year; 4) a few times a month; and 5) at least once a week (test-retest r=0.73). Those who reported being teased a few times a

year or more were considered to have experienced weight-related teasing. We selected this cut-point for frequency of weight-related teasing based on previous analyses in this study population that found that this level of teasing was associated with adverse psychological and behavioral outcomes (2,3).

Weight status

Body Mass Index (BMI) was based on self-reported height and weight measures, and calculated with the formula weight in kilograms divided by squared height in meters. The correlations between reported and measured BMI were r=0.88 for both females and for males. Sex and age specific cutoff points used to classify respondents as overweight (≥ 85th percentile) at baseline were based on reference data from the Centers for Disease Control and Prevention growth tables (17).

Sociodemographic characteristics

Sex, age, ethnicity/race, and socioeconomic status (SES) were based on self-report. Ethnicity/race was assessed with the question: 'Do you think of yourself as…? 1) White, 2) Black or African American, 3) Hispanic or Latino, 4) Asian American, 5) Native Hawaiian or Pacific Islander, 6) American Indian or Native American, or 7) Other' (Test-retest agreement = 98–100%). Since very few adolescents reported 'Hawaiian or Pacific Islander' they were coded as 'mixed/other' at both time points. SES was determined primarily using the higher education level of either parent, based on adolescent report (range: 1–5, test-retest r=0.90). To prevent the misclassification of participants as high SES based on education if their family had economic stress, an algorithm was developed that also took into account family eligibility for public assistance, eligibility for free or reduced-cost school meals, and parental employment status (12).

Statistical Analysis

Longitudinal trends—To examine longitudinal trends, we calculated adjusted percentages of reported frequent weight-related teasing for the two time points of EAT-I and EAT-III. Due to age and gender differences in weight-related teasing, we conducted these analyses separately for females and males, and separately for the younger and the older cohorts. Because attrition from the baseline sample did not occur at random, in all analyses, data were weighted using the response propensity method (18). Response propensities (i.e., the probability of responding to the EAT-III survey) were estimated using a logistic regression of response at follow-up on a large number of predictor variables from EAT-I and observations were then weighted inverse to the individual propensity score (18). For illustration, white females were more responsive at EAT-III and minority males less responsive, so a response from a white female at EAT-III is down-weighted, while a response from a black male is up-weighted. This method restores the longitudinal sample to have approximately the same characteristics as the full sample in EAT-I (Table 1).

We fit logistic models, adjusting for the demographics of age, race/ethnicity, socioeconomic status, and BMI within genders and within cohort, to examine longitudinal trends in teasing. The logistic model gives parameter estimates on the logit scale, which were converted to predicted probabilities of frequent weight- related teasing given specific characteristics. We

estimated standard errors by the method of Generalized Estimating Equations (GEE) to allow for the correlation of experiences of persons reporting at multiple times (19). Separately for females and males, we estimated longitudinal trends in the probabilities of reporting frequent weight-teasing within cohorts of younger and older participants and constructed tests for differences in percentages reporting frequent weight-teasing, over the study period (longitudinal trends). Test p-values are from estimates on the logit scale to better approximate the Gaussian distribution. Because the prevalence of weight-related teasing is higher among overweight and obese adolescents (4,5), we repeated this analysis for the stratum of those overweight/obese at baseline in order to examine the impact weight status may have on longitudinal trends in teasing.

Secular trends—To examine secular trends in weight-related teasing we compared prevalences among early and middle adolescents in the EAT-I in 1999 to prevalences in the EAT 2010 survey data among the same age groups. The sample characteristics of the EAT-I and EAT 2010 samples differed considerably, so a new propensity score was estimated for being in the EAT-I versus being in the EAT 2010 survey (18). Inverse-propensity weighting was again used to remove bias in the EAT-I survey data. Using these weights we were able to adjust for the socio-demographic differences in the samples, as demonstrated by the similarity of the weighted EAT-1 sample and the EAT 2010 sample (Table 1).

Using weighted logistic regression with adjustments for age, race/ethnicity, SES, and BMI, we modeled reports of frequent weight-related teasing at the two survey occasions by analysis of variance (survey-year by cohort) within gender strata. We repeated these analyses by gender in the strata of those who were overweight or obese at baseline. Analyses were carried out using SAS Ver.9.2; the procedure GENMOD was used to estimate the logistic models.

Results

Longitudinal trends in weight-related teasing among the total longitudinal sample

At baseline (1999), in the longitudinal sample, approximately 29% of early adolescent females in the younger cohort and 23% of middle adolescent females in the older cohort reported being teased about their weight at least a few times a year. The prevalence of weight-related teasing did not change significantly among the early adolescent females (mean age 12.8 years) who transitioned to early young adulthood (mean age = 23.2 years) or among the middle adolescent females (mean age = 15.9 years) who transitioned to middle young adulthood (mean age =26.2 years) over the study period (Figure 1).

In the longitudinal sample of males, about 18% of males in both age cohorts reported frequent weight-related teasing at baseline. The prevalence of weight-related teasing did not change significantly in the older cohort as the males transitioned from middle adolescence to middle young adulthood, but increased significantly in the younger cohort as participants progressed from early adolescence to early young adulthood (18.2% to 26.5%, p= 0.03; Figure 2).

Longitudinal trends in weight-related teasing among overweight youth

At baseline in the longitudinal sample, prevalence of weight-related teasing was high among overweight early adolescent (40.0%) and middle adolescent (28.2%) females. There were no significant longitudinal changes in weight-related teasing in either age cohort of overweight females (Figure 1).

Among overweight males, approximately 37% of the early adolescent males and 29% of the middle adolescents reported being teasing about their weight at baseline. As was seen with overweight females, the prevalence of weight-related teasing did not change significantly over the study period for either age cohort (Figure 2).

Secular trends in weight-related teasing among the total secular sample

The prevalence of weight-related teasing tended to decrease from 1999–2010, however differences did not reach statistical significance in all subgroups. Among early adolescent females, the prevalence of weight-related teasing significantly decreased by 9.5% (p=<0.001) from 1999 to 2010 (Table 2). Weight-related teasing decreased by 3.7% among middle adolescent females from 1999 to 2010, although this decrease was not statistically significant (p=0.109).

Among early adolescent males, weight-related teasing decreased by 4.4%, although this was not statistically significant (p=0.073; Table 2). Weight-related teasing significantly decreased by 7.6% (p=0.001) among middle adolescent males from 1999 to 2010.

Secular trends in weight-related teasing among overweight youth

Among early adolescent females who were overweight, the prevalence of teasing significantly decreased by 10.4% (p=0.020) from 1999 to 2010 (Table 2). Weight-related teasing decreased by 5.8% (p=0.142) among middle adolescent females who were overweight, although this decrease was not statistically significant. Among males who were overweight, the prevalence of weight-related teasing decreased by 6.7% (p=0.160) among early adolescent males and by 8.1% (p=0.066) among middle adolescent males, although these changes were not statistically significant.

Discussion

The current study examined 10-year longitudinal and secular trends among an economically and ethnically diverse sample of adolescents. Contrary to our hypothesis regarding the longitudinal trends that weight-related teasing would decrease as study participants transitioned from adolescence to young adulthood, we found that the prevalence of weight-related teasing remained high and relatively stable from adolescence to young adulthood for most adolescents and increased among males transitioning from early to late adolescence during the study period. Our secular trend analyses revealed large decreases in weight-related teasing from 1999 to 2010, particularly among early adolescent females.

Our longitudinal findings suggest that weight-related teasing is not confined to childhood and adolescence and instead is ubiquitous throughout young adulthood. Little is known about teasing in adulthood. Weight-related teasing may remain a common form of

mistreatment among adults and participants may experience weight-related teasing from colleagues at their workplace or various individuals they encounter throughout their daily activities. It is also possible that the teasing perpetrators are key members of the participants' social network, e.g., a family member or close friend, and therefore the participants cannot easily avoid contact with these individuals. Thus, although young adults likely have more control over with whom they interact than an adolescent who is attending school or college, this additional control would have little effect on teasing rates if the individual who is teasing them is a close friend or family member. Findings from Project EAT III show that a high percentage of young adults report receiving hurtful comments about weight and shape from family members and their significant others; 36% of young adult females and 23% of young adult males reported receiving hurtful weight-related comments by family members and 21% of females and 24% of males with reported receiving hurtful comments from their significant others (20). It is also possible that individuals who are teased early in life may come to accept and expect this kind of treatment from those close to them and therefore do little to avoid the mistreatment (21).

Our examination of secular trends among early and middle adolescents suggests that weight-related teasing decreased from 1999 to 2010. This was contrary to our hypothesis and to Andreyeva and colleagues' finding that weight discrimination increased among American adults from 1994 to 2006 (10). The participants in Andreyeva et al.'s study were older than those included in our study; therefore, their findings may not generalize to our sample. The different measures used to assess weight-related mistreatment may also explain differences in results. Andreyeva and colleagues assessed general weight-based discrimination by asking participants to report frequency of discriminatory experiences and then to state the primary reason for this discrimination, whereas we asked specifically about participants' experiences being teased about weight. These methods may be measuring different aspects of weight-related mistreatment and may be subject to different types of bias (e.g., response bias).

Our secular findings may suggest that the increased media and research attention on bullying over this time period (22, 23) led to changes in school-level policies and/or social norms regarding weight-based discrimination among youth. The secular decrease in general bullying behaviour among U.S. males in the Health Behaviour in School-Aged Children supports this explanation of our findings (9). A second explanation is that the increasing rates of obesity among youth (24) may lead to less weight-related teasing due to normalization of larger body sizes. Given the evidence that weight-related teasing can lead to behaviors that put youth at greater risk for excessive weight gain, including binge eating (3) and decreased physical activity (25), reducing weight-related teasing is an important step to creating environments that support healthful weights for all youth. Of note, in a previous analysis of secular trends from 1999–2010 in the same Project EAT sample, we found secular decreases in unhealthy weight control behaviors, particularly among female adolescents (24). It may be that the decrease in weight-related teasing is, at least, partially responsible for this decline.

Study limitations that should be noted include the use of a single, self-reported measure to assess weight-related teasing, which may have reduced the reliability and validity of the

measurement. Given that little research has been done examining teasing among adults, it is also unknown if the meaning of weight-related teasing is different for young adults as compared to adolescents. Study attrition is also a limitation in the EAT-III study. Compared to the original sample, participants who completed the EAT-III surveys were more likely to be white and in the upper SES categories. To address this limitation, we used sampling weights that corrected for this nonresponse bias in all analyses. Although we used inverse-propensity weighting to match the populations racially and socio-demographically, some differences in the populations may persist, which could influence our secular results, given that the prevalence of weight-related teasing has been shown to differ by race/ethnicity (26). Thus, it is possible that the differences in the EAT-I and EAT 2010 samples may account for some of the secular change in weight-teasing that was observed. Additional age-matched secular studies are needed to confirm our findings.

Study strengths that enhance its contribution to the literature include the 10-year longitudinal design, which allowed us to examine the changes in reported weight-teasing across a range of key transitional periods of adolescence and young adulthood, as well as the ability to examine secular trends from 1999–2010 among early and middle adolescents. The size and socioeconomic and racial/ethnic diversity of both the EAT-III and EAT 2010 samples enhances the generalizability of the findings.

Our findings regarding longitudinal trends in weight-related teasing suggest that weight-related teasing remains high and relatively stable as adolescents transition to young adulthood. Because of the adverse psychological and physical health implications associated with weight-related teasing, our findings suggest that interventions and policies aimed at reducing weight-related bias and discrimination should be implemented and evaluated throughout adolescence and young adulthood. Among young adults these interventions may include college or work-based policies banning weight-related bias or mistreatment or community-based campaigns to change social norms regarding weight-related talk (e.g., Fat Talk Free Week) or teasing (27).

Overall, our secular trends suggest that prevalence of weight-related teasing may have decreased among early and middle adolescents from 1999 to 2010. Additional research is needed to replicate these findings to see if similar decreases have occurred in other populations. Further exploration into the possible impact school-level policies addressing harassment or social norms regarding body shape and size may have on weight-related teasing rates is needed to help elucidate the key factors influencing the secular trends observed among early and middle adolescents.

Acknowledgements

This study was supported by Grant Number R01HL084064 from the National Heart, Lung, and Blood Institute (PI: Dianne Neumark-Sztainer). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Heart, Lung, and Blood Institute or the National Institutes of Health.

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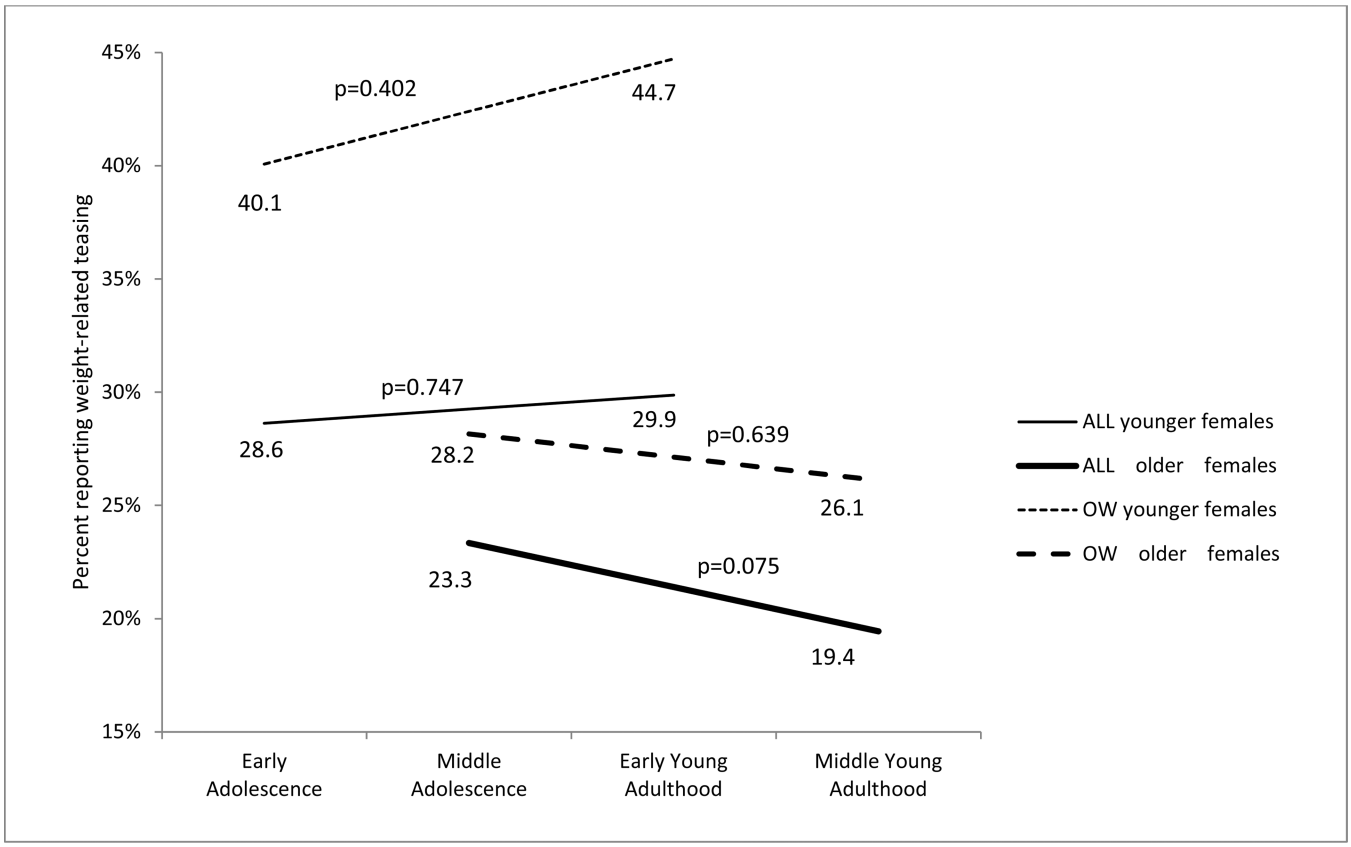

Figure 1.

Longitudinal trends in prevalence of frequent weight-teasing by age-cohort in all females and in overweight females, adjusted for age, socio-economic status, ethnicity/race, and BMI. P values test change over time.

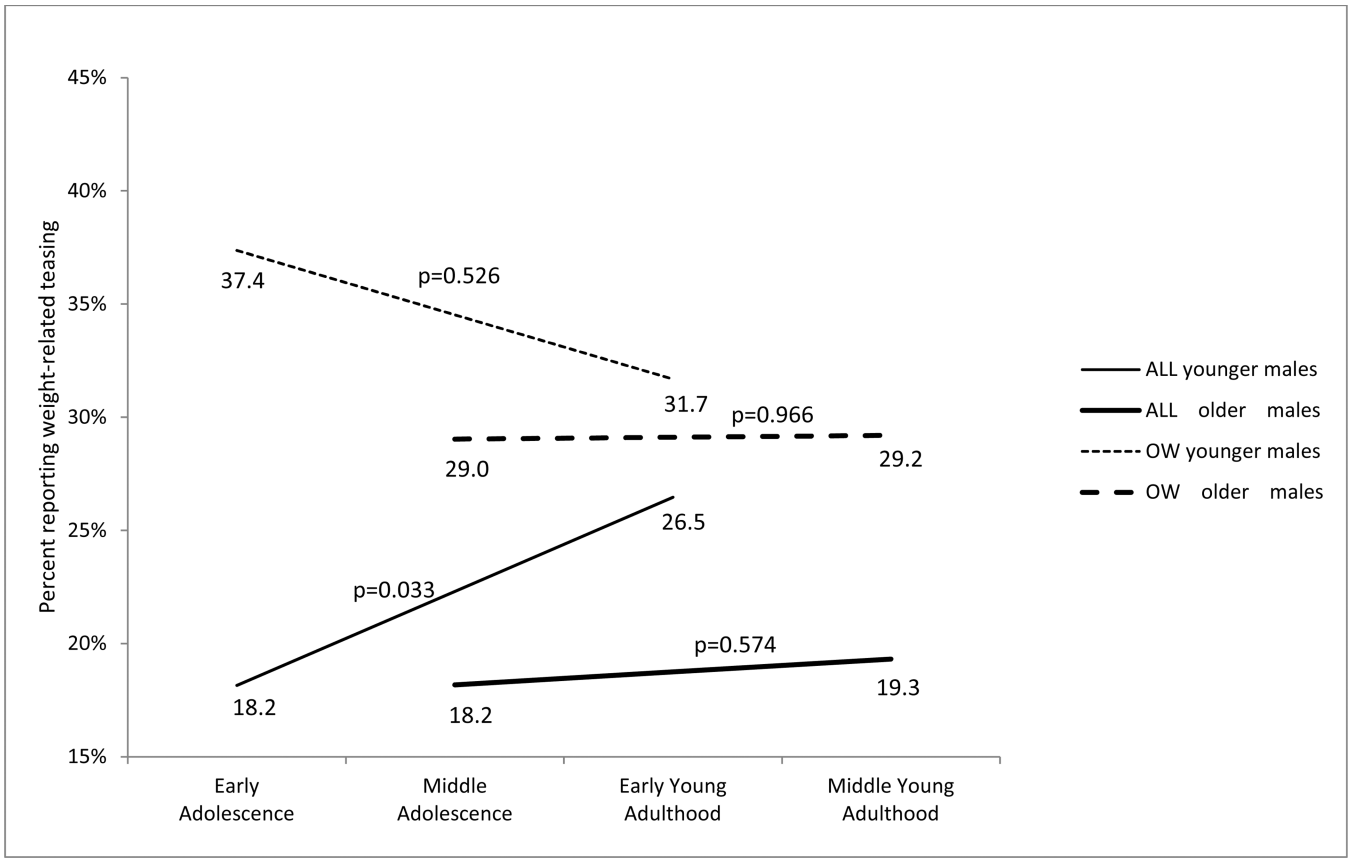

Figure 2.

Longitudinal trends in prevalence of frequent weight-teasing by age-cohort in all males and in overweight males, adjusted for age, socio-economic status, ethnicity/race, and BMI. P values test change over time.

Table 1

Baseline socio-demographic characteristics (as percentages) of the EAT-I/EAT-III sample for longitudinal trends, and of the EAT-I/EAT 2010 samples for estimating secular trends, by gender*

	Sample for longitudinal trend analyses		Sample for secular trend analyses			
	EAT-I/EAT-III sample at baseline		Females		Males	
	Females (n=1257)†,§	Males (n=1030)†,§	EAT-I (n=1601) ††, //	EAT 2010 (n=1485)	EAT-I (n=1414) ††, //	EAT 2010 (n=1304)
Age cohort						
Early adolescence	30.0	29.9	47.2	46.4	45.0	45.9
Middle adolescence	70.0	70.1	52.8	53.6	55.0	54.1
Race						
White	46.5	50.8	17.3	16.8	22.0	21.2
Black	21.4	15.2	29.7	29.0	29.1	29.1
Hispanic	5.3	6.6	17.0	17.3	17.2	16.6
Asian	19.3	19.8	20.3	19.9	20.7	19.9
Other	7.5	7.6	15.7	17.0	11.0	13.2
SES						
Upper	13.4	13.7	6.1	6.1	9.3	9.2
Mid-upper	21.8	25.2	12.0	11.6	14.5	14.4
Middle	27.0	25.2	16.4	16.7	19.0	18.5
Mid-lower	18.7	19.3	21.5	21.5	22.9	22.9
Lower	19.1	16.6	44.0	44.1	34.3	35.0
BMI ≥ 85th percentile	33.3	30.4	37.2	38.7	33.4	41.9

*Numbers differ slightly down the columns due to incidental missing data in the cross-classification variable.

†Sample includes participants who completed both the EAT-I and EAT-III surveys.

††Sample includes participants who completed the EAT-I survey.

§Data are weighted to account for non-response bias in the EAT-III survey.

//Data are weighted to remove bias arising from the differences in the survey samples of EAT-1 and EAT2010.

Table 2

Secular trends in prevalence of weight-related teasing in all adolescents and in overweight adolescents, by gender, adjusted for socioeconomic status, race/ethnicity, and BMI.

	Early Adolescence: Secular Trends						Middle Adolescence: Secular Trends					
	Early Adolescence EAT-I 1999*		Early Adolescence EAT 2010		Early Adolescence	*p*††	Middle Adolescence EAT-I 1999*		Middle Adolescence EAT 2010		Middle Adolescence	*p*§
	N	%	N	%	% change		N	%	N	%	%change	
Females:												
Total female sample†	755	30.4	689	20.9	−9.5	<0.001	846	28.4	796	24.7	−3.7	0.109
Overweight females†	276	43.8	269	33.5	−10.4	0.020	319	35.8	306	30.0	−5.8	0.142
Males:												
Total male sample†	636	21.4	598	17.0	−4.4	0.073	778	26.6	706	18.9	−7.6	0.001
Overweight males†	228	39.9	269	33.2	−6.7	0.160	244	37.3	278	29.2	−8.1	0.066

*Prevalence rates may differ from longitudinal analyses due to differences in the EAT-1 sample used for the secular analyses.

†Data are weighted to remove bias arising from the differences in the survey samples of EAT-1 and EAT2010.

††*P* value for secular trend in early adolescence.

§*P* value for secular trend in middle adolescence.