Overweight in Children: The Perspectives of 9–13 Year Olds

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ABSTRACT

Children and adolescents in the United States are increasingly overweight at younger ages. Many studies have investigated the issue from the perspective of professionals and other adults. This study assessed early adolescents' perceptions regarding the magnitude of, effects of, causes of, solutions for, and learning preferences related to overweight. Data were obtained from 1,168 students, grades four to eight, who visited nine health education centers. Data were collected anonymously via electronic keypads. Analyses were based on multivariate and nominal logistic regressions. The majority of students believed childhood overweight is a problem (52%), and thought overweight is primarily caused by (55%) and can be addressed through (68%) nutrition and exercise. Most preferred to learn through doing (joining an active group or cooking demos, 43%) instead of listening (school lessons, 8%). Further, most (60%) perceived that overweight children and adolescents have a more difficult time making friends. Girls were more likely to report that they were worried about their weight (AOR=2.9, CI=1.6–3.8; p=0.00), have been spoken to about their weight (AOR=2.0, CI=1.6–2.7; p=0.00), and have tried to lose weight (AOR=1.8x, CI=1.4–2.5; p<0.01). Students who perceived themselves to be about the right weight were more likely than those who described themselves as underweight to say they have tried to lose weight (AOR=2.3, CI=1.6–3.3; p=0.00). Recommendations are given to assist health educators in developing programs that address overweight among early adolescents.

INTRODUCTION

Prevalence of overweight in children and adolescents, partly a manifestation of a changing society, has more than tripled since the early 1970s.[1] Factors such as less exercise,[2] consuming more high calorie snacks, and generally sedentary habits appear to be involved in this increased prevalence of overweight in children and adolescents.[3–5] In 2000, 16% of adolescents (ages 12–19) and 15% of children (ages 6–11) were classified as overweight and an additional 15% of adolescents and 15% of children were considered "at risk for overweight."[1,6–8] The National Center for Health Statistics (NCHS) defines "overweight" in children and adolescents as at or above the 95th percentile of the sex-specific body mass index (BMI) for age growth charts.[1] Those between the 85th and 95th percentiles are classified as "at risk for overweight." Overweight youth are at greater risk than those of normal weight of becoming overweight adults and developing obesity-related health conditions during childhood or adolescence that could last through adulthood (e.g., type 2 diabetes, high cholesterol, hypertension, and sleep apnea).[9] Overweight

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youth are also at higher risk for reporting social and psychological problems such as low self-esteem, depression, eating disorders, and types of social discrimination.[10–13]

Assessing adult perceptions of the antecedents and consequences of youth overweight is relatively commonplace in obesity research. For example, several studies have identified perceptions of child or adolescent overweight among parents,[14] school principals,[15] physical education teachers,[16] school nurses,[17] and administrators.[18–19] These adults believe the primary causes of youth overweight are unhealthy food choices, lack of parental responsibility, overreliance on modern technology, mass media messages,[18] and lack of knowledge or motivation among youth.[20] Although the assessment of adult stakeholders is important, the voices of youth should be amplified when assessing needs and assets of those in this age range. Assessing the perceptions of youth is also consistent with principles of participatory research.[21]

A better understanding of overweight from children's or adolescent's perspectives may help in several ways. Designing effective programs and curricula requires that health educators and researchers pay attention to the preferences and experiences of youth. Identifying youth perceptions may lead to a better understanding of underlying causes of childhood and adolescence overweight and thereby aid efforts to change social influences. Additionally, including youth perceptions of overweight could also give youth a more active role in the process of developing solutions to challenges they face.

Educational materials or programs based on participant feedback creates effective and empowering programs for focal groups (e.g., adolescents),[22] and they take more responsibility and action regarding their development when they are more actively involved in health promotion.[23] Surveying and using youth opinions sends a message that their involvement in the discussion of health issues, in addition to their participation in health programs and research, is important. However, in many schools, the process of empowering students is a break from tradition. Assessing, listening to, and understanding the perspectives of youth requires a shift of power and influence from adults (e.g., educators or teachers) to youth (e.g., students).[24] Beyond the benefits of developing more effective programs, the process of completing surveys may help youth recognize risk in their own behavior, and thereby facilitate additional information seeking or improved behavior. Additionally, youth who participate in survey research may experience increases in self-control and improved decision-making capacity.[25]

Only a few studies have investigated how children or adolescents perceive the issue of childhood overweight and the causes of overweight.[26] In a large sample of third graders, body dissatisfaction and overweight concerns were prevalent across gender, ethnicity, and socioeconomic class.[26] Another study found that overweight children were significantly more likely to engage in dieting behaviors, to express concern about their weight, and to exhibit more dissatisfaction with their body image than average-weight children, suggesting emergence of disordered eating beliefs and behaviors.[27] Additionally, in most studies, girls reported more concern about body image and practiced more weight control methods, whereas boys are more concerned with musculature.[28–29]

To narrow this gap in understanding, this study examined child and early adolescent perceptions of social and personal consequences of overweight, perceived causes of overweight, beliefs about maintaining or changing weight, and preferences regarding prevention and intervention programs. This study will address three primary research questions. First, relative to early adolescent males, do early adolescent females more frequently report that they perceive themselves to be overweight, worry about their weight, have tried to lose weight, have been talked to about their weight, or have tried to diet? Based on body image research, the researchers expect that females would report more of these weight-focused perceptions. Second, do early adolescent perceptions match the public health position that overweight is an epidemic among children and adolescents? Third, does perceived weight status predict response differences regarding weight-focused beliefs, perceptions, and experiences? Findings from this research could guide health educators in developing more effective weight management programs for children and early adolescents.

METHODS

Sample

We obtained data from 1,168 early adolescents, ages nine to thirteen, who attended programs at nine health education centers in the Illinois, Indiana, North Carolina, Pennsylvania, and Wisconsin. These centers, which are not affiliated with the schools, are members of the National Association of Health Education Centers (NAHEC). The centers are similar to youth science centers except they have the primary goal of teaching about health and the human body. Most schools schedule field trips to centers for individual classes to participate in health education experiences. We chose to sample through centers because they provide an alternative setting in which to triangulate research in school settings, and because past experience has shown that schools attending the centers approximate national averages for school-level demographics. Additionally, the centers provided an opportunity to sample a large number of students in a relatively narrow time frame.

Staff at each center recruited classes to participate from a list of schools scheduled to visit the center. Center staff contacted officials at each school, prior to the school's trip to the center, to arrange permission to give the survey during the visit. Class selection was convenient to the classes scheduled for visits during the study period in November, 2003. Three to seven classes participated at each center. To further facilitate intra-center diversity, staff at each center were instructed to recruit no more than two classes from the same grade and no more than two classes from the same school. Classes from 22 schools participated. In ac-

cordance with center and school policies, parental permission was passive and was given with the permission to attend the field trip. School administrators and teachers reviewed the survey prior to administration. Center staff invited, but did not require, all students in a selected class to participate. Students not wishing to participate were told to remain in the room but to not answer the questions. Because students were anonymous, those who chose not to participate could not be distinguished from those who had malfunctioning keypads.

Procedures

Computer systems (Computer Polling System—CPS or Audience Response System—ARS) were used to anonymously collect data from multiple students who respond via remote electronic keypads. Centers routinely use these systems as part of their educational programs and staff members had previous training on using the systems to collect data for research. Preceding or following a health education program on an unrelated topic, center staff explained the purpose of the study, explained that participation was anonymous and voluntary, and taught the selected classes to use the hand-held keypads. To administer the survey, staff read the instructions for the survey and then read each question and answer choice to the students as they simultaneously appeared on a large screen. All questions were closed-ended; participating students indicated their choices by pressing corresponding letters on their keypads. Following data collection, center staff gave all adults present copies of a two-page information sheet. This included current findings, resource lists, ideas for teaching the topic, and key questions teachers, parents, and youth could ask to further a discussion of the issue.

Measures

Data were collected at two levels: student and school. Student-level data were collected from individual students via handheld keypads. The students were presented two demographic questions (age and gender), four questions regarding personal experiences related to obesity (perceived weight, worry about weight, spoken to about weight, and attempts to lose weight) and five opinion questions related to child overweight (magnitude of the problem, primary causes, primary remedies, best way to learn about, and social issues for overweight children). Four questions (perceived weight, worry about weight, magnitude of the problem, and social issues) used ordinal answer choices; the other questions offered nominal choices.

Due to the data collection method, remote keypads, and known time constraints, as well as researcher interests, all questions were original to the study. Based on literature review and previous surveys at these centers, a research advisory team and the authors developed a large pool of questions and a survey script related to experiences with and attitudes toward youth overweight. The advisory team included a child psychologist, a school principal, a schoolteacher, a parent, a state-level health education coordinator, and two center directors.

The survey was pilot tested with two classes at one health education center. Following each pilot, center staff asked a sample of the children who took the survey as well as the teachers and other adults present for qualitative feedback regarding the overall appropriateness of the survey and specific feedback regarding question wording. The survey and script were revised based on the pilot data and qualitative comments. Due to the method of data collection, all of the questions were close-ended with a maximum of five answer choices. Some of the questions used four- or five-point quasi-interval response scales, while others offered five distinct nominal answer choices. The nominal answer choices were randomly ordered, whereas the quasi-ordinal answers choices were ordered sequentially. The final version of the survey included eleven total questions.

Center staff also recorded the school and school district to which each class belonged. From this information, school level data were obtained from the National Center for Education Statistics (NCES). Among other statistics, the NCES reports school size, urban-to-rural locale code, ethnic/racial proportions, and proportions participating in free and reduced lunch programs.[30]

Analysis

Descriptive statistics were analyzed for both student and school level data, and individual level data were examined through chi-square tests. Multivariate logistic regression analysis was used to simultaneously test the associations between the predictor variables (gender, age, reported weight, and school-level variables) four personal criterion variables (reported weight, worry about weight, been spoken to about weight, and tried to lose weight) and two criterion weight-related beliefs variables (is obesity a problem, and is it harder for overweight kids to make friends). For these analyses, outcome variables were recoded into dichotomous categories and levels of some of the predictor variables were collapsed to increase cell sizes. As a measure of effect, adjusted odds ratios (AOR) were examined at a 95 percent confidence interval (CI). A confidence interval that includes the value "1" indicates a non-significant association ($p \geq 0.05$). Finally, nominal logistic regression examined the simultaneous association between the predictors and four polychotomous outcome variables (perceived primary cause of overweight, best way to learn about maintaining a healthy weight, best way to control weight, and most frequently used weight loss method).

Additionally, proportions for ethnicity, reduced lunch participation, and locales were analyzed at the level of the school. These data represent the school that the student attends not the individual student. For example, a high score for reduced-lunch participation means that the student attended a school where a large percentage of the students received reduced lunch, not necessarily that that student received reduced-lunch.

RESULTS

Demographics

The participating schools were diverse across population locales, school size, ethnicity, and household income (repre-

Table 1. School Level Data—Proportion of Participants from Schools in Each Category

	Current Study		NCES Averages 2001
	n	(%)	(%)
School city size			
large city center	250	(22%)	(15%)
mid-size city center	307	(27%)	(31%)
large city fringe	171	(15%)	(17%)
mid-size city fringe	285	(25%)	(8%)
small city	0	(0%)	(13%)
rural	125	(11%)	(16%)
School size	[mean = 462]	[mean = 477]	
0–300	68	(7%)	(9%)
300–750	758	(65%)	(46%)
750–1500	308	(27%)	(30%)
1500+	0	(0%)	(14%)
School Ethnicity			
White	626	(55%)	(61%)
African American	330	(29%)	(17%)
Hispanic	125	(11%)	(17%)
Asian/Pacific Islander	46	(4%)	(4%)
Native American	11	(1%)	(1%)
School lunch participation			
free lunch	444	(39%)	
free or reduced lunch	512	(45%)	(45%)

Note: NCES averages = National Center for Educational Statistics Report 2001; N=1138

sented by reduced lunch participation). As a group, the schools participating in this sample approximated NCES national averages[31] on the reported measures with few exceptions (Table 1). Our sample included a higher proportion of schools from mid-size cities (52% vs. 39%) and a lower proportion from small cities (0% vs. 13%). This sample also represented schools with slightly more black students (29% vs. 17%) (Table 1). Males and females were nearly equal in the sample (47% vs. 53%). The average age of the participants was 10.5 with younger children over represented (26% = 9-year-olds, 40% = 10-year-olds, 18% = 11-year-olds, and 15% = 12/13-year olds).

Survey Responses

Table 2 summarizes responses for the total sample. Over half of the early adolescents (52%) participating believed that too many children are overweight but only one in five (19%) replied that *way too many kids are overweight.* Even though fewer than a quarter described themselves as overweight, more than half responded that they worry at least *once in a while* about their weight; 27% worry at least weekly and 14% worry daily. More than half said that someone has spoken to them about their weight, usually a parent. Half reported that they have tried to lose weight; most through healthy eating, exercise, or eating out less; but ten percent have tried dieting, and three percent say they have taken medication. The majority of the students believed that it was harder for overweight children to make friends with nearly a third claiming it is *a lot harder*. Based on self-perceptions, four percent of the children described themselves as *very overweight* and 18% chose the term *slightly overweight*. More than half of the sample described themselves as *about the right weight,* 14% *slightly underweight, and* eight percent as *very underweight*.

When asked to choose, from a short list, the most important cause for children being overweight, similar proportions (approximately one in four) selected lack of exercise, poor diet, or foods available at "fast-food" restaurants, whereas only 11% named genetics. Regarding the best way to control one's body weight, more than two-thirds responded that eating healthy and exercising was the best method. Seventeen percent responded that dieting was the best; seven percent said nothing it just happens; two percent believed taking medicine; and five percent said they didn't know. Finally, choosing among alternatives, a third reported that doctors or nurses were the best sources for learning about maintaining a healthy weight; another 27% believed that joining a group or club focused on teaching them about physical activity was the best; 16% named demonstrations on how to fix healthy food; 15% reported parents; and only eight percent selected a lesson at school.

Differences by Gender

Multivariate logistic regression and nominal logistic regression tested age, gender, reported weight, and school-level variables as simultaneous predictors of personal weight-related responses or beliefs. To be included in each of the analyses, a participant needed to have recorded a valid response for every variable in the analysis.

In the presence of other predictors, gender was a significant predictor of three personal weight-related responses. Girls were more likely to have reported that they worried about their weight (AOR=2.9; CI=1.6–3.8), have been spoken to about their weight (AOR=2.0, CI=1.6–2.7), and have tried to lose weight (AOR=1.8, CI=1.4–2.5; Table 3). Girls were also more likely to have reported that it is more difficult for overweight kids to make friends (AOR=1.5, CI=1.2–2.0; Table 3). Respondents did not differ by gender with regard to their self-reported weight or their perceptions of overweight being a problem among kids. Based on nominal

logistic regression, responses differed by gender regarding beliefs about the best way to control weight (Table 4). Boys were more likely to say going on a diet or taking medicine was the best way or that they did not know. Girls were more likely to say eating health and exercising, or nothing—it just happens (Table 2).

Differences by Age

In the presence of other predictors, students did not differ by age with regard to any of the personal weight-related responses, nor perceptions of overweight being a problem among kids or difficulty in making friends (Table 3). Based on nominal logistic regression, age did influence which weight loss methods were tried (Table 4).

Differences by Reported Weight

In an adjusted model, reported weight affected the likelihood of giving certain responses. As may be expected, students who perceived themselves to be overweight were much more likely than those who think they are underweight to have reported that they worry about their weight (AOR=4.6, CI=3.0–7.3), have been spoken to about their weight (AOR=2.7x, CI=1.8–3.9), and have tried to lose weight (AOR=4.8, CI=3.0–7.5; Table 3). Further, students who perceived themselves to be about the right weight were more likely than those who described themselves as underweight to say they have tried to lose weight (AOR=2.3, CI=1.6–3.3; Table 3). Perceived weight did not change the likelihood of reporting that overweight is a problem among kids or that it's harder for overweight kids to make friends (Table 3). Additionally, reported weight affected responses to which weight loss methods have been tried (Table 4).

Differences by School-level Variables

Although the continuous school-level variables showed some statistically significant differences, when included in a model with the other predictor variables, the variances from 1.0 were not practically significant. School locale affected three responses. Students from schools located in the center of large or midsize cities were more likely to describe themselves as overweight (AOR=2.4–2.4, CI=1.1–5.1 & 1.2–4.6; Table 3). Those from large central city schools were also more likely to say they have been spoken to about their weight (AOR=2.4, 1.2–4.8; Table 3). Those from schools in the fringe of large or mid-size cities (i.e., suburbs) were less likely to report having tried to lose weight (AOR=0.2–0.3, CI=0.1–0.5 & 0.2–0.7; Table 3). School locale also affected perceptions of the best way to learn about keeping a healthy weight and the best way to control weight (Table 4).

DISCUSSION

Overall, females tend to report negative weight-focused beliefs more frequently than males. These results are consistent with body image research with adolescents. Females are more likely to perceive themselves as overweight, worry about their weight, talk about weight issues, try to lose weight, and to more frequently perceive social consequences of weight. Weight-focused perceptions and beliefs of early adolescent females should receive consideration when

Table 2. Questionnaire and Frequencies of Responses (Total and by Gender)

	Total		Boys		Girls	
	n	(%)	n	(%)	n	(%)
Is there a problem with overweight kids today?						
Yes—way too many kids are overweight	220	(19.4)	110	(21.1)	104	(17.7)
Some—more are overweight than should be	371	(32.8)	158	(30.3)	209	(35.7)
No—I don't think there is a problem	243	(21.5)	121	(23.2)	117	(20.0)
I don't know	298	(26.3)	133	(25.5)	156	(26.6)
How would you describe your weight?						
Very overweight	47	(4.1)	21	(4.0)	25	(4.2)
Slightly overweight	204	(17.9)	82	(15.7)	121	(20.5)
About the right weight	632	(55.6)	290	(55.4)	322	(54.7)
Slightly underweight	166	(14.6)	92	(17.6)	72	(12.2)
Very underweight	88	(7.7)	38	(7.3)	49	(8.3)
How often are you stressed or worried about your weight? **						
Never	515	(45.5)	309	(58.9)	195	(33.6)
Sometimes—but not every week	310	(27.4)	105	(20.0)	195	(33.6)
Often—at least once a week	152	(13.4)	53	(10.1)	98	(16.9)
All the time—about every day	156	(13.8)	58	(11.0)	93	(16.0)

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Table 2. Questionnaire and Frequencies of Responses (Total and by Gender) (continued)

	Total		Boys		Girls	
	n	(%)	n	(%)	n	(%)
Who talks to you individually about your weight the most? **						
No one ever talks to me about my weight	503	(44.1)	283	(53.3)	213	(36.5)
My mom or dad	357	(31.3)	138	(26.0)	210	(36.0)
A relative	76	(6.7)	25	(4.7)	47	(8.1)
A friend	89	(7.8)	40	(7.5)	46	(7.9)
Someone else not listed above	115	(10.1)	45	(8.5)	67	(11.5)
Compared to other kids, how hard or easy is it for overweight kids to make friends? **						
A lot harder	342	(30.3)	137	(26.2)	197	(33.9)
A little harder	340	(30.1)	151	(28.9)	179	(30.8)
About the same as other kids	340	(30.1)	179	(34.3)	156	(26.9)
A little easier	34	(3.0)	19	(3.6)	14	(2.4)
A lot easier	74	(6.5)	36	(6.9)	35	(6.0)
If kids are overweight, what is the most important cause?						
Fast-food restaurants serve the wrong foods	218	(19.5)	106	(20.5)	106	(18.5)
Overweight kids don't get enough exercise	325	(29.1)	143	(27.6)	176	(30.8)
It runs in their family	117	(10.5)	66	(12.7)	47	(8.2)
Overweight kids don't eat right	274	(24.6)	116	(22.4)	150	(26.2)
Some other cause not listed	185	(16.3)	87	(16.8)	93	(16.3)
What is the best way to learn about how to keep a healthy weight?						
Lessons at school	88	(8.4)	42	(8.7)	42	(7.8)
Demonstrations on how to fix healthy food	164	(15.6)	77	(15.9)	85	(15.7)
From a parent or family member	158	(15.0)	79	(16.3)	77	(14.3)
From a nurse or doctor	356	(33.8)	145	(29.9)	199	(36.9)
Joining a group or team that teaches me about physical activity	286	(27.2)	142	(29.3)	137	(25.4)
Which of the following is the best way to control body weight? **						
Go on a diet	194	(16.9)	108	(20.4)	84	(14.3)
Take medicine	23	(2.0)	17	(3.2)	6	(1.0)
Eat healthy & exercise	786	(68.6)	330	(62.4)	433	(73.6)
Nothing it just happens	82	(7.2)	35	(6.6)	46	(7.8)
I don't know	61	(5.3)	39	(7.4)	19	(3.2)
Which way have you tried to lose weight? **						
I haven't tried to lose weight	456	(41.3)	245	(48.3)	199	(34.8)
Went on a diet	108	(9.8)	45	(8.9)	63	(11.0)
Ate healthy & exercised	425	(38.5)	161	(31.8)	254	(44.4)
Ate out less	85	(7.7)	38	(7.5)	45	(7.9)
Took medicine	30	(2.7)	18	(3.6)	11	(1.9)

Notes: X^2 tests significant for gender at $p<0.05$; ** $p<0.01$; N=1138

Table 3. Adjusted Odds Ratios for Weight-related Responses According to Gender, Age, Reported Weight, and School-level variables

	Described self as overweight	Often stressed about weight	Been spoken to about weight	Has tried to lose weight	Thought it's a problem among kids	Thought it's harder for overweight kids to make friends
	AOR (CI)	AOR (CI)	AOR (CI)	AOR (CI)	AOR (CI)	AOR (CI)
Gender						
Girls	ns	2.9**(1.6–3.8)	2.0**(1.6–2.7)	1.8**(1.4–2.5)	ns	1.5**(1.2–2.0)
Age	ns	ns	ns	ns	ns	ns
Reported weight						
Over	NA	4.6**(3.0–7.3)	2.7**(1.8–3.9)	4.8**(3.0–7.5)	ns	ns
Right	NA	1.3 (0.9–1.9)	0.9 (0.6–1.2)	2.3**(1.6–3.3)	ns	ns
Under	NA	1.0	1.0	1.0		
School-level variables included as covariates						
School size	1.0* (1.0–1.0)	1.0* (1.0–1.0)	ns	1.0* (1.0–1.0)	1.0* (1.0–1.0)	1.0* (1.0–1.0)
% Minority	1.0* (1.0–1.0)	ns	1.0* (1.0–1.0)	1.0* (1.0–1.0)	ns	ns
% Reduced lunch	ns	ns	1.0* (1.0–1.0)	ns	ns	ns
Locale						
Large city center	2.4* (1.1–5.1)	2.4* (1.2–4.8)	ns	1.7 (0.9–3.5)	ns	ns
Mid-size city center	2.4* (1.2–4.6)	0.9 (05.–1.6)	ns	1.1 (0.6–2.0)	ns	ns
Large city fringe	1.0 (0.4–2.1)	0.7 (0.3–1.4)	ns	0.2** (0.1–0.5)	ns	ns
Mid-size city fringe	1.3 (0.7–2.5)	0.6 (0.3–1.1)	ns	0.3** (0.2–0.7)	ns	ns
Rural	1.0	1.0		1.0		

Note: AOR=adjusted odds ratio; CI=confident interval; ns=not significant; *=p<0.05; **=p<0.01; N=1077

developing curricula or programs tailored to early adolescent females. This emphasis is important because early adolescent females were three times as likely to report worrying about their weight compared to adolescent males.

The proportion of students who reported perceptions consonant with the public health messages regarding the epidemic of overweight in children and adolescence was relatively low. About half of the early adolescence surveyed reported that they either did not know about or did not believe overweight was a problem for children and adolescents. Only about one in five youth reported beliefs consistent with a weight crisis among youth. This belief was consistent across age as well as gender. Health educators and other stakeholders in public health need to improve the knowledge of youth regarding the problems of being overweight during childhood or adolescence. Additionally, youth reported preferences towards learning about overweight from physicians/nurses and through engaging in clubs, groups, or teams. Health educators could use these preferred learning contexts as outlets to improve the knowledge of adolescence regarding overweight. They should also assure that health education and physical education provide opportunities for learning "by doing."

Although this study measured perceived body weight and not actual body fat, the proportions of children in perceived bodyweight categories were similar to measures of actual body weight in national studies. Approximately 30% of children (age 6–11) struggle with overweight (15% overweight, and another 15% at risk of overweight based on BMI growth charts).[1] In our study almost a quarter perceived themselves as being overweight, though only 4% selected the term "very overweight." Based on BMI growth charts,[1] about 3% of children and adolescents ages 6–18 in the U.S. are underweight, compared to 8% in our study who said they are very underweight. This means about two-thirds of children and adolescents are "average" weight, which was comparable to the number in this study who perceived themselves as the right weight or slightly underweight.

A majority of the youth attributed the primary reason for children or adolescents becoming overweight to individual behavior (lack of exercise and poor nutrition). As

Table 4. Likelihood Ratio Tests from Nominal Regression of Gender, Age, Reported Weight, and School-level Variables on Four Categorical Questions

	Most important cause			Best way to learn			Best way to control			Which method tried		
	X^2	df	sig.	X^2	df	sig.	X^2	df	sig.	X^2	df	sig.
Gender	21.1	4	0.73	8.1	4	0.09	15.4**	4	0.00	3.0	3	0.39
Age	13	12	0.37	5.3	12	0.95	19.6	12	0.08	17.5*	9	0.04
Reported weight	3.8	8	0.88	12.1	8	0.15	11.0	8	0.20	35.7**	6	0.00
School level variables included as covariates												
School size	6.7	4	0.16	5.3	4	0.25	32.0**	4	0.00	1.2	3	0.77
% Minority	5.7	4	0.23	1.2	4	0.089	32.7**	4	0.00	1.1	3	0.77
% Reduced lunch	3.6	4	0.46	3.6	4	0.47	127.6**	4	0.00	0.8	3	0.86
Locale	22.0	16	0.14	33.1**	16	0.00	166.2**	16	0.00	19	12	0.09

Note: *=p<0.05; **=p<0.01; N=1077

could be expected, these youth were also more likely to report that the best way to control one's weight is through exercising and healthy eating. This attribution to personal behavior may explain some of the prejudice students who are overweight feel from their peers.

Perceiving oneself as about the right weight or underweight is not a deterministically protective factor for worrying about one's weight. For example, a majority of the youth who categorized themselves as "about the right weight" worries, at least once in a while, about their weight and reported that someone has spoken to them individually about their weight. What we do not know is whether this is because the children misperceived their weight, because the adults talking to them were overly concerned, or that some of these children, who currently consider themselves the right weight, were previously overweight. Another possibility is that some of these adolescents may be showing early signs of disordered eating. It may be helpful to investigate whether the increased attention on overweight in children is adversely affecting those disposed to such disorders. This could also lead to a discussion of the issue of screening for such disorders at an earlier age. Isolating these associations will require further examination with a longitudinal sample. Additionally, more than half of the "right weight" youth and over 40% of those who rated themselves as "underweight" say they have tried to lose weight. Fortunately, most have attempted weight loss by exercising and eating healthy, but about one in ten have tried dieting and a few have taken medicine to lose weight. An interesting follow-up study would be to ascertain where these children are getting their medicine and whether it is prescription or over-the-counter.

Another important topic involves the psychosocial consequences of perceived overweight. For example, self-rated overweight, right weight, and underweight children all agreed that it is more difficult for overweight children and adolescents to make friends. Moreover, these youth also did not differ much in their perceptions of what causes overweight, the best ways to control weight, or what they think is the best way to learn about controlling weight.

A key to altering the trajectory of the obesity epidemic in the United States is early prevention because lifestyle patterns learned in youth tend to become adult habits. Therefore, health educators must help young people adopt healthy habits and avoid early weight gain. Effective program planning and curriculum development should involve the participants. For example, health educators could review units on nutrition to assure that they include student involvement activities.

Although about half of the youth underestimated the problem of overweight in adolescents, most recognized that becoming overweight is associated with nutrition and physical activity patterns. Health educators should reinforce these perceptions in childhood and adolescence and help to further build knowledge and skills focused on the reduction of obesity through an ecological approach that includes not only schools but also physician/nurses and early adolescent clubs, groups, and teams.

The limitations of this study warrant consideration. Cross-sectional design prevents causal inferences due to the potential threats to internal validity and non-random sampling also limits the generalizability of results. However, the sample did approximate national demographic characteristics of students in the United States and was spread across multiple states. Additionally, limiting answers to one of five closed-end options (the five most cited during pilot tests) and the order the answer options were presented also may have influenced student responses and possibly attenuated some associations.

Assessing and listening to early adolescent students could help facilitate environments conducive to developing knowledge and skills. For example, early adolescents preferred to learn about weight control by

methods (e.g., learning how to prepare healthy meals or joining a group that promotes activity) other than school-based lectures. Yet many school districts, in the face of budgetary constraints, are reducing physical activity opportunities to focus on core subjects (e.g., reading, writing, mathematics, and science). As a result, many students do not have the opportunity to participate in competitive sports, recreational activities or other types of informal physical activity. Additionally, many youth want to hear from medical professionals, doctors or nurses, but many may not have access to allied health professionals, especially those who are uninsured or underinsured. Finding creative ways to utilize and integrate physicians and nurses into coordinated health programs could help to deliver health messages that are perceived to be credible by young people. Schools that already have nurses or school-based health centers could utilize these resources to inform their students regarding the problem of obesity in the United States. Schools that do not have these resources on site could collaborate with local agencies and organizations to communicate health messages to youth.

It will likely take a coordinated effort from an ecological perspective, involving schools, families, medical professionals, communities, and the media, to address the issue of overweight in children and adolescents. Involvement of participants can facilitate components of the coordinated school health plan. Health educators should attempt to coordinate health services to collect and utilize early adolescent perceptions to tailor their programs to improve children's and adolescents' knowledge and skills regarding obesity.

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