Friends Like Me: Associations in Overweight/Obese Status among Adolescent Friends by Race/Ethnicity, Sex, and Friendship Type

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Abstract

Background: Little is known about how interpersonal friend relationships are associated with obesity in young people, particularly with regard to how race/ethnicity, type of friendship, and sex affect the association between friends' and adolescents' weight status. This study examined associations in weight status among adolescents and their friends, exploring magnitudes of associations across friendship type, sex, and race/ethnicity.

Methods: As part of EAT-2010 (Eating and Activity in Teens), friend nominations and anthropometrics were obtained from adolescents ($n=2099$: 54% female; 80% nonwhite; mean age: 14.2 ± 1.9 years). Generalized estimating equation logistic regression models were used to test associations between adolescents' overweight/obese status and friends' (*i.e.*, friend group, female friends, male friends, female best friends, and male best friends) overweight/obese status. Interactions by adolescent race/ethnicity were examined.

Results: The majority of significant associations were observed among white female adolescents' who had a 22–40% higher prevalence of overweight/obesity if their friends were overweight compared to white females whose friends were not overweight. In contrast, there were few significant differences for other adolescent female and male racial/ethnic groups for girls and boys. Results for friend groups and best friends were generally similar to one another.

Conclusions: The association between friend and adolescent overweight/obese status depended on adolescents' sex, race/ethnicity, and friendship type. Given the similarities among friends, obesity interventions targeting youth, especially white females, should consider involving friends.

Introduction

As adolescents assert independence from parents, they align themselves with friends. Social development and growth of complex friendships are hallmarks of adolescence; much of adolescent identity formation is tied to their friends.^{1–4} The Socio-Ecological Model^{5,6} and the Social Cognitive Theory⁷ emphasized the importance of social influences as they interact with other factors to impact health behaviors and health outcomes. The friendship domain is of particular relevance to ado-

lescents given their developmental stage and the importance of friendships during this period. Friend groups and friend influence have been shown to be associated with the adoption of risky health behaviors, such as unhealthy weight control,^{8,9} smoking,¹⁰ and early sexual initiation.¹¹ A heightened focus on friends and their role in adolescent risk for overweight is needed given that these youth could be engaged as critical points for prevention and treatment.

With few exceptions,^{12–15} the work describing the relationship between friendship network on young people's risk for obesity has been limited to analyses from the

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National Longitudinal Study of Adolescent to Adult Health (Add Health) originating with youth who were in middle and high school during 1994–1995.^{16–20} This body of literature has mixed results, with conclusions reporting: (1) no associations of weight status among friends^{20,21}; (2) noncausal correlations¹⁴; (3) homophily (the selection of friends who are more like themselves)^{13,17,18,22}; and (4) influence (contagion) of friends on adolescent weight status.^{16,19} Though the current consensus in the literature is that young people's and their friends' obesity status is linked, few studies have replicated findings with a contemporary sample of diverse middle and high school students, a population who may experience interactions with friends differently than earlier generations.^{23–25}

Thus, the primary aim of this study was to assess the associations between adolescents' and friends' overweight/obese status among a large, racially/ethnically diverse sample of adolescent friendship networks. Two types of friends (friend group and best friends) for female and male adolescents were examined to assess differential effects on weight status by type of friendship. This study will advance the field by explicitly analyzing similarities and differences in weight status among friends by race/ethnicity and by friendship type. By understanding relationships among these subgroups of friends, health practitioners working with youth can better address the social environment that may be involved in weight gain during this life stage. Friends could be incorporated into obesity treatment strategies; explicitly investigating racial/ethnic differences may indicate cultural differences in groups, which could strengthen obesity intervention approaches relying on friendship ties.

Methods

Study Design

Data were drawn from EAT-2010 (Eating and Activity in Teens), a multilevel investigation of eating behaviors, physical activity (PA) patterns, and weight-related outcomes among a large and diverse sample of adolescents. The overall study design was based on the socioecological model^{5,6} and social cognitive theory⁷. Specifically, we examined factors of potential relevance to eating, PA, and weight-related outcomes from within the domains of the individual, family, friends, schools, and neighborhood. Youth ($N=2793$; mean age: 14.4 ± 2.0 years) from 20 Minneapolis/St. Paul middle and high schools completed in-class surveys and friend nomination forms. Trained research staff collected height and weight measurements. Passive parental consent for study participation was given for each student under 18. All participating students provided written assent and were provided with a \$10 gift card. The University of Minnesota's institutional review board and the research boards of the participating school districts approved all study protocols.

Friendship nomination was assessed according to protocols from previous studies^{8,19,26} and published else-

where.^{27,28} Briefly, participants recorded and ranked ID numbers of their three closest female and male friends. Students were asked to identify their best friends as the first person listed in either sex category. Allowing for an open network, students were permitted to nominate fewer than six friends, as well as to indicate whether they had close friends who did not attend their school (these friends were not surveyed). Overall, 77% ($n=2126$) of the original sample had at least one friend in the data set and were included in the analysis. Some students had missing height and weight measures ($n=27$); the final analytical sample for this study was 2099.

Measures

Weight status. Height and weight measurements were assessed by a trained research assistant, using standardized equipment and procedures.²⁹ BMI was calculated for each student, using the CDC guidelines.³⁰ Students at or above the 85th percentile for sex and age were considered overweight/obese.

Sociodemographic characteristics. School-level, sex, race/ethnicity, US-born status, and socioeconomic status (SES) were based on self-report from the EAT-2010 student survey. To create the *school-level* variable, those participants in sixth, seventh, and eighth grade were classified as being in middle school; those in 9th–12th grade were considered high school students. *Race/ethnicity* was based on the survey question: “Do you think of yourself as: (1) white; (2) black or African American; (3) Hispanic or Latino; (4) Asian American; (5) Hawaiian or Pacific Islander; or (6) American Indian or Native American?” Adolescents could choose more than one category, and those with multiple responses were coded as “mixed/other” for analyses. Participants were grouped into the five SES groups (low, low-middle, middle, upper-middle, or high) where the prime determinant of SES was parental education level, defined by the higher level of educational attainment of either parent. 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.³¹

Creation of the Friend Predictors: Friendship

Type and Friends' Overweight/Obese Status

Participants' friends were classified to the five groups (friend group, female friends, male friends, best female friend, and best male friend), as in our previous analyses.^{27,32} The *friend group* measure included all friends with available data who were nominated by the adolescent; the friend group measure was separated by sex (*female friends* and *male friends*). *Best friends* were nominated/ranked first in either sex category, as was instructed on the survey (*best female friend* and *best male friend*).

The measured weight status of each nominated friend was linked by ID number to each individual adolescent,

allowing for the creation of friend predictors unique to each participant. A dichotomous indicator for whether the majority of friends were overweight/obese was created from each adolescent's friend group. If the *majority* (50% or more) of those in the adolescents' friend group were overweight/obese, then the friend group was considered to be overweight. If the majority of friends were not overweight, then the friend group was considered to be not overweight. When examining associations among best friends, the prevalence of adolescent overweight status was determined by best friend's overweight/obese status (yes/no). In order to account for varying numbers of friends for each adolescent, a covariate, *number of friends with data*, a simple sum of the number of nominated friends included in the data set, was included.

Statistical Analyses

Differences in adolescents' weight status were examined by race/ethnicity, school level, US-born status, and SES groups, and were stratified by sex. Chi-square and *t*-tests were used to test if differences were statistically significant. The prevalence of adolescent overweight/obese status was estimated conditional on the friends' overweight/obese status. Analyses were adjusted for adolescent SES, US-born status, school level, and number of friends with data. Separate logistic regression models were estimated for female and male adolescents and by friendship type (friend group, best friends) and by friends' sex.^{30,33} Regression models included interaction terms between friend overweight/obese status and adolescent race/ethnicity. These interactions by adolescent race/ethnicity were found to be significant (on both the additive and multiplicative scale). The predicted prevalence of overweight/obese status (at the mean or modal value of other covariates in the regression model) was estimated from these models for adolescents whose friends were and were not overweight/obese. Adjusted differences and 95% confidence intervals (CIs) were calculated from these predicted prevalences. Statistical significance was assessed at $p < 0.05$. All analyses were run using Stata statistical software (Release 10; StatCorp LP, College Station, TX).

Results

A high percentage of adolescents (40.5%) were overweight/obese. Among females, weight status differed across race/ethnicity, US-born status, and SES status (Table 1). Among males, weight status differed by race/ethnicity, SES status, age, and school level.

Among female adolescents, in the unstratified analyses, the adjusted prevalence of being overweight/obese was significantly higher if the majority of females' friend group and female best friends were overweight/obese (Table 2). Race/ethnicity modified the relationship between girls' and friends' overweight/obese status for all types of friendship categories examined. When stratified by race/ethnicity, 6 of the 30 associations between females and their friends

were statistically significant. In general, white girls had higher prevalences of overweight/obese status based on friends' overweight/obese status: For four of the five types of friend variables, white girls had significantly higher prevalences of being overweight/obese if their friends were overweight/obese (differences ranged from 17.1% to 39.8%). For example, white females had almost 40% higher prevalence of being overweight/obese if their female best friends were overweight/obese as compared to white females whose female best friends were not overweight/obese (Table 2). In contrast, there were few significant differences for other adolescent female racial/ethnic groups, with the exception of male friends for Hispanic/Latina females and female friends for Native American females.

Among boys, in unstratified analyses, the prevalence of being overweight/obese was significantly higher if the majority of males' friend group and male best friends were overweight/obese (Table 3). For example, the predicted prevalence of overweight/obese was 8% higher for males whose friend group was overweight/obese than for males whose friend group was not overweight/obese. In analyses stratified by race/ethnicity, associations between males' weight status and friends' status were significant for select racial/ethnic groups and specific types of friends, but the direction and magnitude of these relationships varied (Table 3); most associations were not statistically significant.

Discussion

The aim of this study was to estimate the associations between adolescents' weight status and their friends' weight status among a recent, diverse sample of youth. Overall, adolescents and their friends tended to be of a similar weight status. Magnitudes of associations between adolescent and friend weight status varied by sex. In the current study, weight status was associated with the majority of friend groups' weight status and same-sex best friends' weight status for both sexes. White girls had more than double the prevalence of being overweight/obese if their friends were overweight/obese compared to white females whose friends were not overweight/obese. For boys, no clear pattern by race/ethnicity emerged, with the magnitude and the direction of the relationships varying by friendship type and race/ethnicity: Some racial/ethnic groups of males had inverse relationships with their friends' weight status, whereas others had strong positive associations with their friends' weight, whereas still others had no association with their friends' weight status. These findings suggest that the engagement of friends in obesity prevention and treatment efforts for youth could be impactful, especially for white girls.

The literature supports homophily (selecting friends similar to oneself) as the driving cause for the observed relationships in weight status among friends.^{13,17} Schaefer and Simpkins found that adolescents avoided the selection

Table 1. EAT-2010 Unadjusted Female and Male Adolescent Demographics by Weight Status (n = 2099)						
	Total sample	Females n = 1128		Males n = 971		p value
		Not overweight/obese <85th percentile 61.9%, n = 698	Overweight/obese ≥85th percentile 38.1%, n = 430	Not overweight/obese <85th percentile 58.0%, n = 563	Overweight/obese ≥85th percentile 42.0%, n = 408	
Age (years) (mean ± SD)	14.2 ± 1.9	14.1 ± 1.9	14.0 ± 1.8	14.5 ± 2.0	14.0 ± 2.0	0.002
School level % (n)						0.043
Middle school	52.5 (1100)	61.3 (369)	38.7 (233)	54.8 (273)	45.2 (225)	
High school	47.5 (997)	62.5 (328)	37.5 (197)	61.2 (298)	38.9 (408)	
Race/ethnicity group % (n)						<0.001
White	20.2 (423)	72.3 (146)	27.7 (56)	70.6 (156)	29.4 (65)	
African American/black	26.6 (557)	55.3 (167)	44.7 (135)	62.3 (159)	37.7 (96)	
Latino/Hispanic	17.7 (370)	56.5 (117)	43.5 (90)	52.8 (86)	47.2 (77)	
Asian American	19.4 (405)	75.8 (160)	24.2 (51)	48.4 (94)	51.6 (100)	
Native American	4.1 (85)	45.6 (21)	54.3 (25)	33.3 (13)	66.7 (26)	
Mixed/other	12.0 (251)	53.5 (83)	46.5 (72)	57.3 (55)	42.7 (41)	
US-born status % (n)						0.389
US-born	83.2 (1742)	60.4 (561)	39.6 (368)	57.4 (467)	42.6 (346)	
Foreign-born	16.8 (352)	68.2 (133)	31.8 (62)	61.1 (96)	38.9 (61)	
Socioeconomic status % (n)						<0.001
Low	29.6 (468)	57.7 (270)	42.3 (198)	51.2 (164)	48.8 (156)	
Low-middle	25.5 (236)	63.1 (149)	36.9 (87)	56.3 (116)	43.7 (90)	
Middle	34.8 (183)	60.7 (111)	39.3 (73)	59.2 (103)	40.8 (71)	
Upper-middle	6.9 (140)	69.3 (97)	30.7 (43)	66.9 (97)	33.1 (48)	
High	3.2 (72)	76.4 (55)	23.6 (17)	74.7 (71)	25.3 (24)	
EAT-2010, Eating and Activity in Teens; SD, standard deviation.						

Table 2. Adjusted Prevalence and Prevalence Differences of Overweight/Obese Status among Female Adolescents^a by Friends' Weight Status^a

	<i>n</i>	Unstratified	Prevalence of female adolescent overweight					
			White	African American	Hispanic/Latina	Asian American	Native American	Mixed/other
			<i>n</i> = 201 Prev Ow (%)	<i>n</i> = 293 Prev Ow (%)	<i>n</i> = 200 Prev Ow (%)	<i>n</i> = 198 Prev Ow (%)	<i>n</i> = 46 Prev Ow (%)	<i>n</i> = 153 Prev Ow (%)
Friend group	1091							
Ow		53.3	49.7	50.5	56.7	22.6	60.7	49.8
Not Ow		43.2	18.3	45.8	40.7	26.8	39.6	46.8
Prev difference ^b		10.1	31.4	4.7	16.0	-4.2	21.1	-3.0
95% CI		1.5, 18.6	18.4, 44.3	-11.5, 21.0	-2.2, 34.1	-12.1, 3.8	-8.9, 51.2	-20.0, 14.2
Female friends*	960							
Ow		53.4	50.0	48.7	55.9	22.9	62.3	48.2
Not Ow		45.2	20.2	50.7	43.4	27.2	33.0	46.7
Prev difference		8.2	29.8	-2.0	12.5	-4.3	29.3	1.5
95% CI		-0.1, 16.5	14.5, 45.2	-17.6, 13.5	-3.5, 28.5	-18.1, 9.5	0.2, 58.4	-17.7, 20.7
Male friends*	687							
Ow		60.0	38.8	59.3	57.4	20.5	55.3	50.8
Not Ow		49.4	16.7	48.0	35.0	35.1	47.9	45.9
Prev difference		10.7	22.1	11.3	22.3	-14.6	7.4	4.9
95% CI		-0.1, 21.2	3.5, 40.8	-0.9, 23.5	3.6, 41.0	-29.6, 0.4	-28.0, 47.8	-7.7, 17.5
Female best friends*	576							
Ow		64.7	64.2	64.8	55.9	32.8	65.1	52.3
Not Ow		54.3	24.5	53.3	55.9	27.3	38.3	51.6
Prev difference		10.4	39.8	11.4	0.0	5.5	-3.2	0.6
95% CI		0.1, 20.4	22.8, 56.7	-6.3, 29.2	-14.6, 14.6	-10.4, 21.5	-41.2, 34.6	-26.2, 27.4
Male best friends*	379							
Ow		56.4	36.3	54.4	53.1	26.6	44.4	58.8
Not Ow		52.6	19.2	54.6	44.2	34.7	65.4	51.1
Prev difference		3.8	17.1	-0.2	8.9	-8.1	-21.0	7.7
95% CI		-8.6, 16.2	-15.1, 49.3	-24.4, 23.9	-11.1, 29.0	-29.1, 12.9	-58.5, 16.4	-6.4, 21.8

Bolded text indicates statistically significant findings at $p < 0.05$.

^aGeneralized estimating equation logistic regression adjusted for race/ethnicity, socioeconomic status, US-born status, school level, and number of friends with data.

^bDifference in prevalence of being overweight/obese if friends (majority or best friends) were overweight/obese over friends were not overweight/obese.

*Indicates significant effect modification by race/ethnicity.

CI, confidence interval; Prev, prevalence; Ow, overweight/obese.

Table 3. Adjusted Prevalence and Prevalence Differences of Overweight/Obese Status among Male Adolescents by Friends' Weight Status^a

	n	Unstratified	Prevalence of male adolescent overweight					
			White	African American	Hispanic/Latino	Asian American	Native American	Mixed/other
			n = 219	n = 248	n = 159	n = 177	n = 38	n = 95
		Prev Ow (%)	Prev Ow (%)	Prev Ow (%)	Prev Ow (%)	Prev Ow (%)	Prev Ow (%)	Prev Ow (%)
Friend group	931							
Ow		44.6	40.6	43.6	56.1	58.6	72.5	47.7
Not Ow		36.7	32.3	37.4	45.4	50.1	57.1	44.3
Prev difference ^b		7.9	8.2	6.2	10.7	8.5	15.4	3.4
95% CI		2.8, 13.0	-7.1, 23.6	-3.0, 15.3	-3.2, 24.6	-3.6, 20.6	-11.6, 42.4	-16.5, 23.2
Female friends	634							
Ow		45.9	45.0	44.1	56.5	48.3	91.6	58.0
Not Ow		38.1	29.2	40.0	49.0	47.5	75.0	49.4
Prev difference		7.8	15.8	4.1	7.5	0.8	16.6	8.6
95% CI		-1.6, 17.1	-5.3, 36.9	-7.5, 15.8	-11.6, 26.6	-22.2, 23.8	-7.5, 40.7	-13.2, 30.4
Male friends	795							
Ow		42.7	38.4	41.7	53.6	56.7	65.0	50.3
Not Ow		33.0	28.8	34.0	36.9	47.5	62.6	40.9
Prev difference		9.7	9.4	7.6	16.7	9.2	2.4	9.4
95% CI		-0.6, 19.6	-4.5, 23.4	-7.7, 23.0	-1.1, 34.5	-4.7, 23.1	-22.2, 27.0	-8.6, 27.4
Female best friends*	452							
Ow		51.5	50.7	57.4	35.6	60.1	80.3	67.7
Not Ow		46.0	35.2	48.3	65.4	52.5	69.7	53.2
Prev difference		5.5	15.5	13.6	-29.8	7.6	10.6	14.5
95% CI		-6.8, 18.0	-23.6, 54.6	-0.5, 27.6	-51.8, -7.7	-25.8, 41.1	-27.0, 48.3	-20.5, 49.5
Male best friends*	379							
Ow		58.0	45.5	55.7	68.4	64.2	92.5	61.1
Not Ow		36.6	55.7	38.5	46.6	43.1	28.6	48.5
Prev difference		21.3	-10.2	17.2	21.8	21.1	63.9	12.6
95% CI		11.6, 31.0	-7.0, 39.6	0.4, 34.0	-0.8, 44.5	-4.1, 46.4	-39.2, 88.7	-9.9, 35.0

Bolded text indicates statistically significant findings.

^aGeneralized estimating equation logistic regression adjusted for race/ethnicity, socioeconomic status, US-born status, school level, and number of friends with data.

^bDifference in prevalence of being overweight/obese if friends (majority or best friends) were overweight/obese over friends were not overweight/obese.

*Indicates significant effect modification by race/ethnicity.
CI, confidence interval; Prev, prevalence; Ow, overweight/obese.

of overweight friends, a factor believed to be responsible for the clustering observed in weight status in adolescents participating in Add Health.¹⁷ Longitudinal findings from a small Australian sample have supported the theory that overweight/obese youth may select friends with similar weight status as a result of marginalization.¹³ Given that white girls were among the lowest prevalence of overweight/obesity and had the most similar weight status among friends, it might suggest that thinner white girls may not choose to befriend overweight/obese peers. Weight stigma may have played a role in the current findings in which white females had similar weight status with friends (best friends and friend groups), but no other race/ethnicity of girls did. There is literature suggesting that beliefs and perceptions about body shape and size aesthetics are culturally driven, with some subgroups indicating that larger body sizes are desirable, particularly for African American and Hispanic females.^{34–36} African and Hispanic American girls have been found to underestimate their own weight status, whereas white girls overestimate their weight.³⁷ This phenomenon may have been a factor when white females in this sample selected or nominated their friends. It is possible that white girls may have not selected (or nominated) friends of weight statuses different than themselves because of their own weight misperceptions or concerns: White overweight girls may be concerned about being overweight, and therefore weight status may matter more in choosing friends. More longitudinal data at the time of friendship selection is needed to confirm these hypotheses.

Friendship influence may also be a possible explanation of the current findings. As is posited by the socioecological model^{5,6} and social cognitive theory,⁷ and supported by developmental theories, it could be hypothesized that adolescent friends are influencing eating and PA choices, leading to similar weights overtime. Experimental research has shown that in the presence of friends, youth tend to eat more and to eat less healthfully than in other conditions.³⁸ Additionally, social factors other than weight may have an impact on the selections of friends and the observed relationships. For example, some youth may develop their friendships based on shared interests, hobbies, or social status unrelated to weight. Given that the majority of the associations between adolescents' and friends' weight status were not significant for adolescents from communities of color, results indicate that this sample of diverse youth may be more accepting of friends of all sizes; cultural differences may be at play.^{30,34} If friends influence weight status, then the same mechanisms could potentially promote healthy weight-related behaviors. Observational studies of friends are limited in their ability to make causal inferences.⁴⁰ However, for some public health purposes, disentangling whether observed associations were owing to homophily, friend influence, or other factors may not be necessary, given that differential associations among subgroups (*e.g.*, race/ethnicity and sex) can be used to inform the development of healthy behavior change and weight

interventions for youth. Given the prevailing belief in the literature that homophily is the cause of these associations among friends, health professionals designing interventions may want to focus on the shared commonalities of friends of similar weights (*e.g.*, white females in this study), while being sensitive to cultural differences among groups of youth. Healthcare providers may want to develop healthy weight management programs for adolescents and their friends who are overweight/obese and may consider creating obesity prevention and treatment programs for youth that are more culture and sex specific. Obesity prevention and treatment programs should address the social factors impacting health behaviors in young people's lives. By not addressing these factors, we may be limited in initiating change, given the power that peers have during this life stage. In a peer education intervention program in diverse high schools, Cawley and colleagues found that the peer mentors were able to help motivate adolescents to decrease sugar-sweetened beverage intake and increase PA levels.⁴¹ Similarly, close friends with healthy behaviors could be engaged to model and promote healthy behaviors. Weight management programs may consider developing interventions that includes a buddy system for two friends who are overweight (especially for white females), given that these youth may be more accepting of advice and insights from each other.

Study strengths should be considered when interpreting findings. The current study is the first, to our knowledge, that has utilized an "open network" study design where we did not saturate schools and nominated friends were included by chance (compared to a closed network where all nominated friends are identified sampled, such as Add Health who tracked at least five friends per sex per participant). An average of 2.1 friends per participant were in the data set, which may be a limitation, given that these friends may not be representative of an adolescent's friend group. However, given that participants were from required health classes, where students do not tend to cluster by similar characteristics, the friends included in our study design were assumed to be a random sample of adolescents' friends. Given this novel, cost-saving design, this study replicated several findings from previous studies while making some unique contributions. The current study included large proportions of youth from low-SES and racially/ethnically diverse groups. With the large sample, this study had the power to examine interactions by race/ethnicity, which has only been examined once previously, using Wave I (1994–1995) data from Add Health.⁴² An additional strength is the use of objective measures of overweight status, which allows for an assessment of the actual associations between adolescents and their friends.

Several limitations should also be taken into account. Point estimates were relatively imprecise, as evidenced by wide CIs, particularly for racial/ethnic groups with smaller sample sizes. Many nominated peers were not included in our survey. The impact of this missingness is difficult to

judge in peer network data, but could bias results. Unmeasured confounding may be involved in the relationships examined in this study, potentially biasing results. In addition, friend influence and homophily are unable to be differentiated in this cross-sectional study. As with much of the literature on friend influence, endogeneity and simultaneity make it impossible to infer causality from these data. Future studies that collect longitudinal data on friend influences would be helpful in this regard.

Conclusions

Friendship type, adolescent sex, and race/ethnicity mattered in associations between adolescents' and their friends' weight. White female adolescents had consistently higher prevalences of being overweight if their friends were overweight/obese. Health professionals addressing obesity- and weight-related interventions targeting adolescents should consider the role of friends and differential relationships by race/ethnicity and sex.

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