Received: 28 August 2023 | Revised: 19 January 2024 | Accepted: 22 January 2024

DOI: 10.1111/ijpo.13108

ORIGINAL RESEARCH

Pediatric OBESITY WILEY

Negative familial weight talk and weight bias internalization in a US sample of children and adolescents

Katherine M. Rancaño[1] | Rebecca Puhl[2] | Margie Skeer[1] | Misha Eliasziw[1] | Aviva Must[1]

[1]Department of Public Health and Community Medicine, Tufts University School of Medicine, Boston, Massachusetts, USA

[2]Department of Human Development & Family Sciences, University of Connecticut, Storrs, Connecticut, USA

Correspondence
Katherine M. Rancaño, Department of Public Health and Community Medicine, Tufts University School of Medicine, 136 Harrison Avenue, Boston, MA 02111, USA.
Email: katherine.rancano@tufts.edu

Funding information
National Institute on Drug Abuse, Grant/Award Number: 1R01DA045073-01A1; National Institute of Diabetes and Digestive and Kidney Diseases, Grant/Award Number: F31DK126399

Summary

Background: Negative familial weight talk may contribute to higher weight bias internalization in pre- and early adolescents (hereafter referred to as children) and may differ by gender, weight status, and race and ethnicity.

Objective: Examine the relationship between negative familial weight talk and weight bias internalization and examine differences by gender, weight status, and race and ethnicity.

Methods: We cross-sectionally analysed 5th–7th graders (10–15 years old) living in Massachusetts ($n = 375$, 52.3% girls, 21.3% BMI ≥85th percentile, 54.8% non-Hispanic White). Negative familial weight talk frequency during the past 3 months was self-reported and discretized as 'never,' 'occasionally' (1–9 times) and 'often' (>9 times); the Modified Weight Bias Internalization Scale assessed weight bias internalization. Generalized linear models estimated the relationship between negative familial weight talk and weight bias internalization and sub-analyses estimated the relationship across gender, weight status, and race and ethnicity. Results are summarized as ratios of means (RoM).

Results: Children experiencing negative familial weight talk occasionally (RoM = 1.12, $p = 0.024$) and often (RoM = 1.48, $p < 0.001$) had significantly higher weight bias internalization than children who never experienced it. In sub-analyses, experiencing negative familial weight talk often was associated with higher weight bias internalization among girls (RoM = 1.66, $p < 0.001$), boys (RoM = 1.32, $p = 0.007$), children with BMI <85th percentile (RoM = 1.44, $p = 0.007$) and BMI ≥85th percentile (RoM = 1.39, $p = 0.001$), and non-Hispanic White children (RoM = 1.78, $p < 0.001$), but not Hispanic (RoM = 1.25, $p = 0.085$) or non-Hispanic Black children (RoM = 1.20; $p = 0.31$).

Conclusions: Frequent negative familial weight talk was associated with higher weight bias internalization across gender and weight status and in non-Hispanic White children only.

Abbreviations: BMI, body mass index; CDC, centers for disease control and prevention; NFWT, negative familial weight talk; WBI, weight bias internalization; WBIS-M, modified weight bias internalization scale.

KEYWORDS
early adolescents, family-based weight stigma, gender, race and ethnicity, weight bias internalization, weight status

1 | INTRODUCTION

As many as 60% of early adolescents are teased because of their weight by family members[1–3] and 25%–46% are encouraged to lose weight through dieting or exercise.[1,4,5] Such derogatory comments about one's weight, body shape or size from family members are a dominant source of weight stigma among early adolescents.[6–9] As there is no consistent definition for this type of weight stigma, for this study, we use *negative familial weight talk* (NFWT) to refer to verbal criticism of one's physical appearance, body weight or body size; negative and/or judgmental remarks about one's weight-related health behaviours; teasing about weight or body size; or name-calling from family members.[8]

The frequency and nature of NFWT can vary according to one's gender, weight status, and racial and ethnic background.[10] Boys and girls tend to experience NFWT at similar frequencies.[10–14] Individuals with a higher body mass index (BMI) report more frequent experiences of NFWT than those with a lower BMI.[1,4,10,15,16] Non-Hispanic White children and adolescents have been historically overrepresented in the weight stigma literature and research on NFWT within other racial and ethnic groups is an emerging area of study. Extant research suggest that NFWT is more frequent among Asian and Hispanic adolescents than non-Hispanic White adolescents[17,18] and may be similar in frequency between non-Hispanic Black and White adolescents.[10,19] The frequency of NFWT may also differ according to a family's degree of acculturation to US culture.[17]

Early adolescence is an important developmental period for cultivating a healthy body image and self-esteem.[20] Frequent experiences of NFWT during this developmental period can deepen underlying weight concerns, prompt negative body self-perceptions, and reinforce weight-based stereotypes and biases which, in turn, can be internalized.[13,16] The internalization of weight-based stereotypes is termed *weight bias internalization* (WBI); it is a form of intrapersonal weight stigma where individuals stigmatize and devaluate themselves because of their weight.[21] Children and adolescents with elevated WBI levels exhibit maladaptive and disordered eating behaviours, declines in mental health, and poor physical health.[13,21–23] Further, WBI may operate as the link between NFWT and the aforementioned health outcomes.[16,24]

Similar to NFWT, gender, weight status, and race and ethnicity may influence the extent of WBI in children and adolescents. Girls and individuals with BMI ≥85th percentile typically have higher WBI levels than boys and individuals with BMI <85th percentile.[11–14,21] Little research has examined racial and ethnic differences in WBI with paediatric samples, but research with adults provides some insight. Non-Hispanic Black and Hispanic adults have lower WBI levels compared with non-Hispanic White and Asian adults,[25–27] yet one study in adults found no difference in WBI across racial and ethnic groups.[28]

Research on weight stigma and topics related to body image and disordered eating has historically focused on girls, but a growing body of evidence demonstrates that boys experience significant body dissatisfaction and are susceptible to eating disorders oriented around muscularity and leanness.[29,30] Similarly, weight stigma research has largely focused on individuals with a higher BMI because their experiences with weight stigma are more frequent and ubiquitous across society (e.g., teasing by peers, demeaning images in media, etc.).[31] Individuals across the weight spectrum, however, experience weight stigma and are susceptible to WBI and its health-related correlates (e.g., disordered eating and body dissatisfaction).[32] Furthermore, the nature, frequency and acceptability of NFWT within families can depend on cultural norms influenced by their racial and ethnic background.[33] Such cultural differences may contribute to some groups experiencing greater increases in WBI in response to NFWT than others. Thus, examination of differences in the relationship between NFWT and WBI across gender, weight status, and race and ethnicity is critical to our understanding of NFWT and its implications to children's and adolescents' health.

Studies that examine the relationship between NFWT and WBI in early adolescents are sparse[25,34] and often have limited generalizability to early adolescents in the United States.[2,12–14,35] Extant studies primarily focus on adolescents who are seeking weight loss treatment[2,12] and often lack racial and ethnic diversity (i.e., ≥90% non-Hispanic White).[2,13,14,35] Elucidating the relationship between NFWT and WBI in children and adolescents is an emerging area of research,[25,34] but how the relationship differs according to one's gender, weight status, and racial and ethnic background is not well understood. To address these research gaps, we assessed the association between NFWT and WBI in a sample of fifth, sixth and seventh grade students (10–15 years old) in Massachusetts and determined whether the association differed by gender, weight status, and racial and ethnic background.

2 | METHODS

2.1 | Study design and participants

The present study is a cross-sectional analysis of baseline data (March 2019 to July 2023) from The Substance Use Prevention Promoted by Eating family meals Regularly (SUPPER) Project, a randomized controlled substance use prevention trial in Massachusetts. Study design details have been previously published.[36] In brief, parents/guardians and their children were recruited through public schools and a participant recruitment agency (User Interviews, www.userinterviews.com). Eligible parents had a child in fifth, sixth or seventh grade and lived with their child at least 50% of the time. Parents and early adolescents with limited proficiency in English and Spanish and early adolescents with developmental disabilities that would interfere with their independent completion of study activities were excluded. Parents and early adolescents provided written informed consent and assent, respectively, and each dyad received a $60 gift card for completed surveys. After consent and assent were obtained, parents and their child participants were asked to complete an online survey at baseline, which were administered online via Research Electronic Data Capture (REDCap). Parents and children received separate surveys and were asked to complete them independently. Hereafter, "child" or "children" refers to the pre- and early adolescents enrolled in the study. All study materials were approved by the Institutional Review Board at Tufts University.

2.2 | Socio-demographic and weight-related variables

Children self-reported their date of birth, gender, school grade (fifth, sixth or seventh) and household structure (i.e., the number of individuals living in their household and their relationship to them). To capture child racial data, participants were asked to self-identify their race ("which of the following best describes you?") and select one or more of the following options: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Pacific Islander, White, or Other. Participants who selected "other" were asked to specify their race. Text entries for specified race were examined and classified by the research team for analysis according to the NIH Style Guide general guidance for Race and National Origin.[37] For example, participants who self-identified their race as "Irish" were classified as "non-Hispanic White." To capture ethnicity data, participants were asked whether they self-identify as Hispanic or Latino/a (do you consider yourself Hispanic or Latino/a?). Racial and ethnic data were combined to create a single race and ethnicity variable. Self-identification as Hispanic or Latino/a overrode self-identified race. For example, participants who self-identified as "Hispanic" and "Black" were analysed as "Hispanic." Participants who self-identified as more than one race were classified as "Non-Hispanic Multiracial.

Parents self-reported their country of birth, annual household income and highest education level. Children self-reported weight stigma from peers (i.e., "have you ever been teased, made fun of, or treated unkindly by children your age because of your weight?").[38,39] Child height and weight were parent-reported and used to calculate age- and sex-adjusted BMI percentiles. In accordance with current terminology preferences for describing weight,[40,41] we use CDC cut points for BMI-for-age percentiles, without descriptive labels, to describe weight status.[42]

2.3 | Negative familial weight talk

Child NFWT was self-reported with five items adapted from the Inventory of Peer Influence on Eating Concerns 'messages' subscale.[43] The tool has not undergone formal validation analysis; however, studies indicate that the 'messages' subscale is significantly associated with disordered eating in children[44] and the tool has been used to estimate NFWT in the Family Meals LIVE! study.[45] To capture recent experiences of NFWT, participants reported how often during the past 3 months parents, siblings and grandparents who live in their household made critical comments about their weight (e.g., "said you were fat," "teased or made fun of you about the size and shape of your body," "said you should go on a diet," "said that you eat food that will make you fat," and "said that you would look better if you were thinner") on a five-point scale ("never" to "almost every day). Responses were converted to estimate frequency during the past three months (e.g., "never" was converted to 0 times and "almost every day" to 71.5; see Table S1). Converted frequencies for the five items were summed for each family member and aggregated to estimate the total NFWT frequency from all family members during the past 3 months (range per family member: 0–357.5 times). Total NFWT frequency was discretized as an ordinal variable: 'never' (0 times) 'occasionally' (1–9 times) and 'often' (>9 times).

2.4 | Weight bias internalization

Children completed the Modified WBI Scale, which was designed to be inclusive of individuals of any body weight and size[46] and validated in children and adolescents.[12,14,22] We used 10 of the 11 items for consistency with previous studies that demonstrated low factor loadings for the first item.[22,47] Participants reported their level of agreement with 10 statements and beliefs about themselves because of their weight (e.g., "I hate myself for my weight") on a six-point scale. The original Modified WBI Scale uses a seven-point scale, but we removed the neutral option ("neither agree/disagree") for our study to reduce participant burden and error as most other items in the survey used a six-point scale. Responses were rescaled for analysis (Table S2) to facilitate comparison with studies that use a seven-point scale and averaged to calculate a mean WBI score (range: 1–7; Cronbach's $\alpha = 0.936$). Higher scores indicate greater WBI levels.

2.5 | Statistical approach

Participant characteristics were summarized with the means and standard deviations for continuous variables and with the frequencies and proportions for categorical variables. Characteristics were compared across the ordinal NFWT frequency categories with one-way analysis of variance and chi-square tests. A generalized linear model with a log link and gamma distribution was used to examine the association between NFWT and WBI. A log link was used because WBI had a right-skewed distribution and results are reported as arithmetic means.[48] A gamma distribution was used because it provided better model fit than a normal distribution. Various child and parental factors were assessed for confounding (e.g., parent weight status, household size, acculturation, etc.), but only child weight status and child peer-sourced weight stigma met the criteria in bivariate analyses. Final models included child weight status, child peer-sourced weight stigma, child age and child gender as covariates. Dose–response relationships between NFWT and WBI were examined by comparing the "occasionally" and "often" NFWT frequency categories to "never" and summarized as ratios of means (RoM) with corresponding 95% confidence intervals (95% CI).

A test of interaction was used to assess whether the association between NFWT and WBI differed by child gender, weight status, and race and ethnicity. Subgroup analyses were conducted irrespective of the statistical significance of the test of interaction to contribute to the limited available information on the relationship between NFWT and WBI within the subgroups (i.e., boys vs. girls, BMI ≥85th percentile vs. BMI <85th percentile, Hispanic vs. non-Hispanic Black vs. non-Hispanic White). We restricted the examination of differences by race and ethnicity to Hispanic, non-Hispanic Black and non-Hispanic White participants because the small number of participants in the remaining categories resulted in problems with parameter estimation and model stability. All statistical analyses were performed using SAS version 9.4 and results with a p value <0.05 were deemed statistically significant (Table 1).

3 | RESULTS

Of the 402 participants with baseline NFWT and WBI data, 375 participants were analysed (27 had missing WBI data). There were no meaningful differences between participants with and without missing WBI data (Table S3). The mean age of participants was 11.9 years (SD = 1.0), 52.1% self-identified as a girl and most participants self-identified as non-Hispanic White (54.7%), Hispanic (23.5%) or non-Hispanic Black (12.5%). Children who experienced NFWT often were most likely to self-identify as a boy ($p = 0.019$), have BMI ≥85th percentile ($p < 0.001$), report weight stigma from peers ($p < 0.001$) have a parent who was born outside of the United States ($p < 0.001$), live in a household with an annual income <$150 000 ($p = 0.044$) and with parents who completed less than a bachelor's degree ($p = 0.009$).

One-quarter of participants experienced NFWT occasionally and 8.2% experienced it often during the past 3 months. As shown in Table 2, the relative difference in mean WBI levels increased in a dose–response pattern across NFWT frequency categories. Children who experienced NFWT occasionally had mean WBI levels that were 11% higher than children who never experienced NFWT (2.40 vs. 2.15, RoM = 1.11, 95% CI = 1.02–1.23, $p = 0.023$). Mean WBI levels were highest among children who experienced NFWT often: their mean WBI was 48% higher than children who never experienced NFWT (3.17 vs. 2.15, RoM = 1.48, 95% CI = 1.27–1.72, $p < 0.001$).

3.1 | Differences by gender

The dose–response pattern between NFWT frequency categories and WBI did not significantly differ by gender (interaction $p = 0.213$). As shown in Table 2 and in Figure 1, when examining boys and girls separately, WBI was significantly higher for girls who reported any occurrence of NFWT. Compared with girls who never experienced NFWT, mean WBI levels were 19% higher among girls who experienced NFWT occasionally (2.72 vs. 2.29, RoM = 1.19, 95% CI = 1.03–1.36, $p = 0.016$) and 66% higher among girls who experienced NFWT often (3.80 vs. 2.29, RoM = 1.66, 95% CI = 1.32–2.07, $p < 0.001$). Among boys, however, WBI levels were significantly higher for only those who experienced NFWT often. Compared with boys who never experienced NFWT, mean WBI levels were 32% higher among boys who experienced NFWT often (2.70 vs. 2.04, RoM = 1.33, 95% CI = 1.08–1.63, $p = 0.005$).

3.2 | Differences by weight status

One participant with BMI < 85th percentile was identified as an extreme data value. This participant had an NFWT frequency that corresponded with the highest category (often) and had WBI levels >5.0, whereas all other children with a similar body weight and NFWT experience had WBI levels <3.0. We conducted sensitivity analysis and determined the extreme data value was influential because the estimated RoM, 95% CI and p value for children with BMI <85th percentile were substantially influenced. Thus, we excluded this participant from the weight status analysis.

Overall, the dose–response pattern between NFWT frequency categories and WBI did not differ by child body weight (interaction $p = 0.765$). As shown in Table 2 and in Figure 2, when children were examined separately according to weight status, children across the weight spectrum had significantly higher WBI levels when NFWT was experienced often, but not when it was experienced occasionally. Children with BMI ≥85th percentile who experienced NFWT often had mean WBI levels that were 39% higher than children of a similar body weight who never experienced NFWT (3.25 vs. 2.34, RoM = 1.39, 95% CI = 1.14–1.69, $p < 0.001$). Similarly, children with BMI <85th percentile who experienced NFWT often had mean WBI levels that were 44% higher than children of a similar body weight who never experienced NFWT (2.82 vs. 1.97, RoM = 1.44, 95% CI = 1.11–1.87, $p = 0.007$).

3.3 | Differences by race and ethnicity

Of the 375 participants, 340 were included in this subgroup analysis: 205 (13.8%) self-identified as non-Hispanic Black, 47 (25.9%) as Hispanic and 88 (60.3%) as non-Hispanic White. The dose–response pattern between NFWT frequency categories and WBI did not differ across the three categories for race and ethnicity (interaction $p = 0.132$). As shown in Table 2 and in Figure 3, when children were examined separately according to their race and ethnicity, significantly higher WBI levels were observed only among non-Hispanic White children who experienced any frequency of NFWT. Specifically, non-Hispanic White children who experienced NFWT occasionally and

TABLE 1 Socio-demographic and weight-related characteristics of participants ($n = 375$).

	Never ($N = 247$)	Occasionally ($N = 97$)	Often ($N = 31$)	p value
Child age (years), mean (SD)	11.7 (1.1)	12.1 (1.0)	11.9 (1.0)	**0.007***
Child grade, *n* (%)				0.095
Fifth	102 (41.3)	25 (25.8)	13 (41.9)	
Sixth	84 (34.0)	42 (43.3)	9 (29.0)	
Seventh	61 (24.7)	30 (30.9)	9 (29.0)	
Child gender, *n* (%)				**0.019***
Girl	142 (57.5)	41 (42.3)	13 (41.9)	
Boy	105 (42.5)	56 (57.7)	18 (58.1)	
Child race and ethnicity, *n* (%)[a]				0.478
Non-Hispanic American Indian/Alaska Native	1 (0.4)	1 (1.0)	0 (0.0)	
Non-Hispanic Asian	10 (4.1)	3 (3.1)	1 (3.2)	
Non-Hispanic Black	31 (12.6)	10 (10.3)	6 (19.4)	
Hispanic	53 (21.5)	23 (23.7)	12 (38.7)	
Non-Hispanic Multiracial	11 (4.5)	6 (6.2)	2 (6.5)	
Non-Hispanic White	141 (57.9)	54 (55.7)	10 (32.3)	
Child weight classification, *n* (%)[b]				**<0.001***
BMI <85th percentile	192 (77.7)	56 (57.7)	10 (32.3)	
BMI ≥85th percentile	55 (22.3)	41 (42.3)	21 (67.7)	
Child weight stigma from peers, *n* (%)				**<0.001***
Never	215 (87.0)	65 (67.0)	19 (61.3)	
Ever	32 (13.0)	32 (33.0)	12 (38.7)	
Child weight bias internalization, mean (SD)	1.7 (1.0)	2.3 (1.2)	3.1 (1.6)	**<0.001***
Parent country of birth, *n* (%)[c]				**<0.001***
Born in the United States	210 (86.1)	73 (75.3)	19 (61.3)	
Born outside of the United States	34 (13.9)	24 (24.7)	12 (38.7)	
Highest household education, *n* (%)				**0.009***
Less than a bachelor's degree	57 (23.1)	28 (28.9)	15 (48.4)	
Bachelor's or graduate degree	190 (76.9)	69 (71.1)	16 (51.6)	
Annual household income, *n* (%)				**0.044***
Less than $26 000	20 (8.1)	13 (13.4)	6 (19.4)	
$26 000–$74 999	19 (7.8)	15 (15.5)	4 (12.9)	
$75 000–$149 999	66 (26.7)	24 (24.7)	10 (32.3)	
$150 000 or more	142 (57.5)	45 (46.4)	11 (35.5)	

[a]None of the participants self-identified as Pacific Islander.
[b]BMI <85th percentile" and "BMI ≥85th percentile" refers to children with an age- and sex-adjusted body mass index that was <85th percentile and ≥85th percentile, respectively.
[c]Three participants were missing data on country of birth and all three reported 'never' for NFWT frequency.
*Group differences were examined with two sample *t*-tests and chi-square tests for continuous and categorical variables, respectively. p value <0.05 denotes statistical significance and is indicated with bolded text and an asterisk (*).

often had mean WBI levels that were 15% higher and 78% higher, respectively, than children of a similar racial and ethnic background who never experienced NFWT (2.55 vs. 2.23, $\text{RoM}_{\text{Occasionally}} = 1.15$, 95% CI = 1.01–1.30, $p = 0.034$; 3.96 vs. 2.23, $\text{RoM}_{\text{Often}} = 1.78$, 95% CI = 1.38–2.30, $p < 0.001$). Despite increases in WBI levels across categories of NFWT, no significant differences in mean WBI levels were observed among Hispanic or non-Hispanic Black children who experienced NFWT at any frequency.

4 | DISCUSSION

To our knowledge, ours is the first study to report a dose–response relationship between NFWT frequency and WBI in a paediatric sample. In our racially and ethnically diverse sample of children from Massachusetts, one-third experienced NFWT at least once during the past 3 months (i.e., occasionally or often). Our results are generally consistent with existing studies that suggest NFWT contributes to elevated

TABLE 2 Adjusted mean weight bias internalization levels across negative familial weight talk frequency categories.

	Never	Occasionally	Often	Occasionally vs. Never	Often vs. Never
	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Ratio of means (95% CI) *p* value*	Ratio of means (95% CI) *p* value*
Overall sample, $n = 375$					
	2.15 (2.01–2.29)	2.40 (2.22–2.61)	3.17 (2.75–3.65)	1.12 (1.02–1.23) 0.024	1.48 (1.27–1.72) <0.001*
Gender, $n = 375$					
Girls	2.29 (2.13–2.48)	2.72 (2.41–3.10)	3.80 (3.06–4.72)	1.19 (1.03–1.36) **0.016***	1.66 (1.32–2.07) <**0.001***
Boys	2.04 (1.87–2.22)	2.15 (1.94–2.39)	2.70 (2.25–3.34)	1.05 (0.92–1.20) 0.43	1.32 (1.08–1.62) **0.007***
Weight status, $n = 374$[a]					
BMI ≥85th percentile	2.34 (2.11–2.61)	2.72 (2.41–3.07)	3.25 (2.75–3.84)	1.16 (0.99–1.36) 0.068	1.39 (1.14–1.69) **0.001***
BMI <85th percentile	1.97 (1.84–2.12)	2.15 (1.93–2.39)	2.83 (2.18–3.67)	1.09 (0.97–1.23) 0.160	1.44 (1.11–1.87) **0.007***
Race and ethnicity, $n = 340$[b]					
Non-Hispanic Black	1.95 (1.69–2.26)	1.96 (1.53–2.52)	2.34 (1.70–3.23)	1.00 (0.75–1.34) 0.980	1.20 (0.84–1.72) 0.31
Hispanic	2.21 (1.97–2.48)	2.05 (1.74–2.42)	2.77 (2.20–3.47)	0.93 (0.76–1.13) 0.450	1.25 (0.97–1.61) 0.085
Non-Hispanic White	2.23 (2.06–2.42)	2.55 (2.29–2.85)	3.96 (3.09–5.09)	1.15 (1.01–1.30) **0.038***	1.78 (1.38–2.30) **<0.001***

[a]One observation was identified as an influential point and was excluded from weight status interaction analysis ($n = 374$).
[b]Analyses were restricted to participants who identified as non-Hispanic Black, Hispanic or non-Hispanic White due to small samples sizes in all other race and ethnicity categories ($n = 340$).
*Generalized linear models with a log link and gamma distribution were used to examine the association between negative familial weight talk (NFWT) and weight bias internalization. Models were adjusted for early adolescents' gender, age, weight status, and peer-sourced weight stigma. Linear contrasts were used to assess differences across levels of NFWT and to compare differences by gender, weight status, and race and ethnicity. $p < 0.05$ denotes statistical significance and is indiated with bold text and an asterisk (*). The ratio of means (RoM) for "occasionally vs. never" was calculated by dividing the "occasionally" mean by the "never" mean for each group separately. The RoM for "often vs. never" was calculated by dividing the "often" mean by the "never" mean for each group separately.

WBI levels in children.[2,13,14,25] Two publications from the PIER study of German children found weight teasing from family members was positively correlated with WBI; our study expands on these analyses by accounting for confounding factors.[13,14] A large study of adolescents in the United States found negative weight communication from mothers and fathers was significantly associated with higher WBI levels, after adjusting for sex, race and ethnicity, parent education level, grade level and weight status.[25] Our study helps fill a gap by accounting for weight communication from siblings. A second study with US-based adolescents found that comments about weight from mothers, but not fathers, were associated with higher WBI levels, but weight teasing from family members was not associated with WBI (models adjusted for age, BMI, and race and ethnicity).[2] This study partially contradicts our study's findings; however, it highlights the complex nature of NFWT. Our study focused on one element of NFWT (i.e., frequency) and other elements can affect how weight-related comments are experienced and, in turn, influence the degree to which weight bias is internalized. Such elements include the source (e.g., mothers, peers, strangers), type (e.g., teasing vs. critical comments about weight) and tone (e.g., condescending vs. respectful) of NFWT,[49] intrapersonal factors (e.g., valuation, self-perception and acceptance of one's weight and body shape)[35] and external factors (e.g., dyadic relationship quality and familial and cultural norms regarding weight and body ideals).

4.1 | Differences by gender

Our findings highlight that NFWT is a salient issue for both girls and boys; nevertheless, we observed some noteworthy gender differences. We found that NFWT at any frequency (i.e., occasionally and often) was significantly associated with higher WBI levels among girls, but among boys, we observed significantly higher WBI levels only when NFWT was experienced often. Compared with boys, studies suggest that girls tend to have higher levels of body dissatisfaction, engage in more appearance-related social comparisons, and are exposed to stigmatizing media content that often differentially targets women and girls.[50,51] For these reasons, girls may be more sensitive to social and cultural pressures to conform to body ideals and internalize weight bias to a greater extent than boys when they experience NFWT, even when it is infrequent. In our study, girls on average had higher WBI levels than boys, even among girls who never experienced NFWT.

Higher WBI levels were observed among boys only at the highest NFWT frequency category. Boys were more resilient to WBI than girls; however, it is also possible that the weight and body concerns that are more typically experienced by boys were not captured by our measure. Indeed, this is a well-cited measurement issue in the eating disorder literature[30] that may also occur in

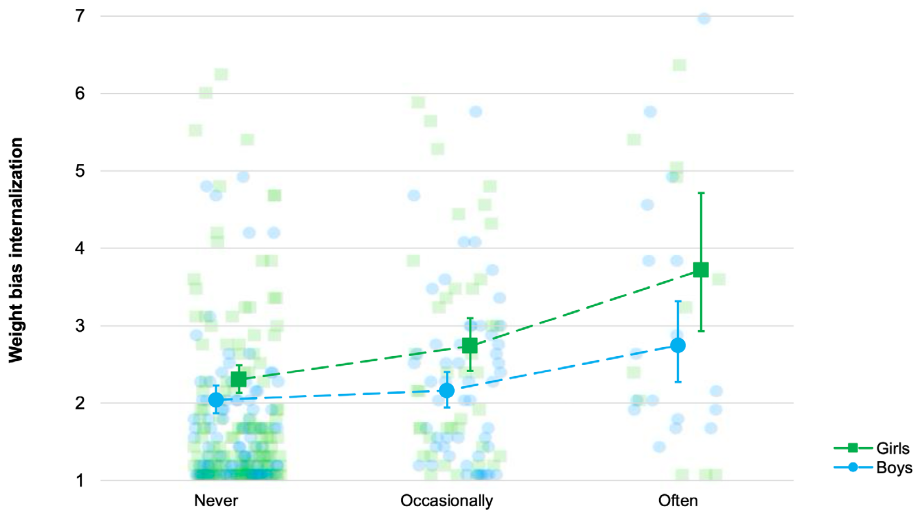

FIGURE 1 Negative familial weight talk (NFWT) was discretized into a three-level ordinal variable using frequency of NFWT during the past 3 months. The NFWT frequency categories are never (0 times), occasionally (1–9 times) and often (≥9 times). The solid shapes (circles and squares) and vertical lines are the adjusted mean weight bias internalization (WBI) and corresponding 95% confidence intervals for the NFWT frequency category. The semi-transparent shapes are the mean WBI levels of the individual participants. The dashed lines illustrate the increase in WBI across NFWT frequency categories. NFWT, negative familial weight talk; WBI, weight bias internalization.

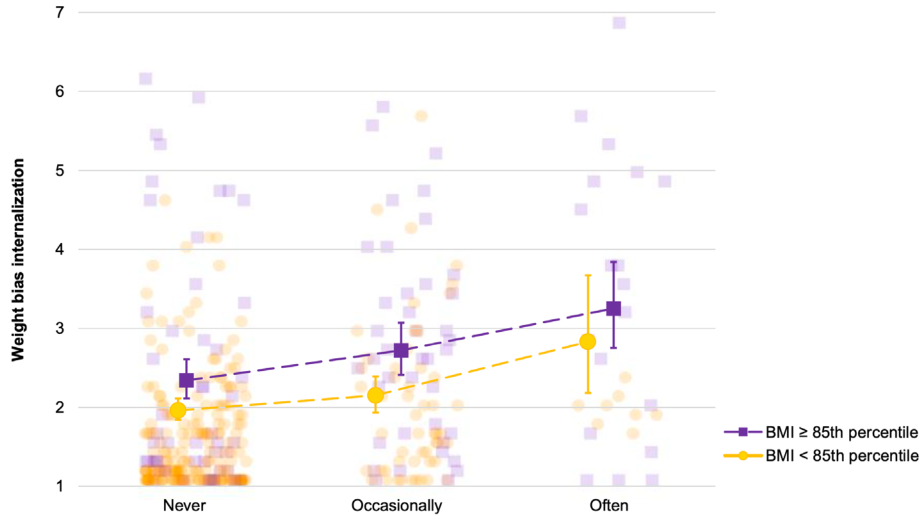

FIGURE 2 Negative familial weight talk (NFWT) was discretized into a three-level ordinal variable using frequency of NFWT during the past 3 months. The NFWT frequency categories are never (0 times), occasionally (1–9 times) and often (≥9 times). The solid shapes (circles and squares) and vertical lines are the adjusted mean weight bias internalization (WBI) and corresponding 95% confidence intervals for the NFWT frequency category. The semi-transparent shapes are the mean WBI levels of the individual participants. The dashed lines illustrate the increase in WBI across NFWT frequency categories. NFWT, negative familial weight talk; WBI, weight bias internalization.

NFWT research.[52] Unlike girls, who often experience thinness-oriented body dissatisfaction, boys' body dissatisfaction is typically muscularity- or leanness-oriented.[53] Yet, many NFWT measures, including ours, assess critical comments about excess weight (e.g., encouragement to diet for weight loss) or are non-specific (e.g., teased for your body weight or shape).[8] Body dissatisfaction in boys and men is associated with adverse outcomes, such as internalized body ideals, poor mental health, muscularity-oriented eating disorders and excessive exercise.[29,54,55] The association observed in our study between NFWT and WBI may have been attenuated by the complex mixture of body concerns that has been observed in boys. That is, boys in our study with BMI ≥85th percentile may have had different body concerns than boys with BMI <85th percentile (i.e., concerns about being too large vs. being insufficiently muscular).The relationship between NFWT and WBI for boys may not be representative of boys who experience critical or judgmental comments about their body shape or size being too small or lacking in muscularity.

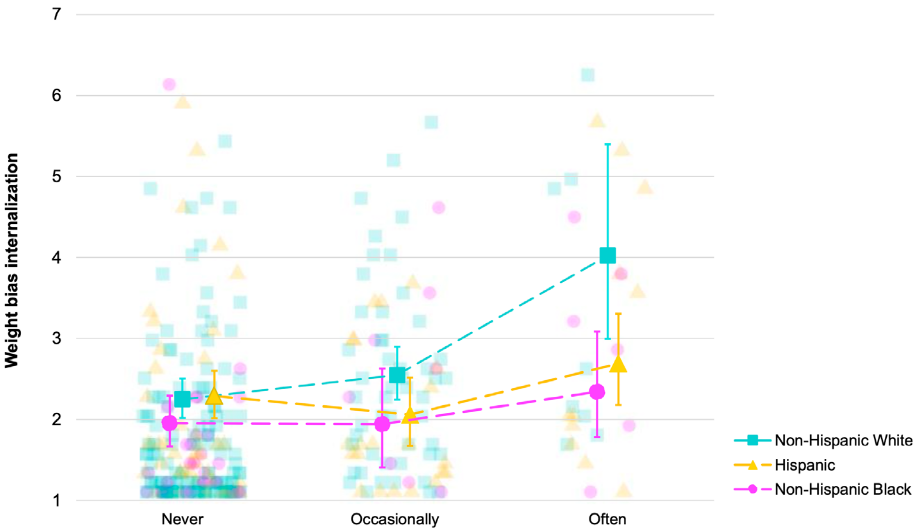

FIGURE 3 Negative familial weight talk (NFWT) was discretized into a three-level ordinal variable using frequency of NFWT during the past 3 months. The NFWT frequency categories are never (0 times), occasionally (1–9 times) and often (≥9 times). The solid shapes (circles, squares and triangles) and vertical lines are the adjusted mean weight bias internalization (WBI) and corresponding 95% confidence intervals for the NFWT frequency category. The semi-transparent shapes are the mean WBI levels of the individual participants. The dashed lines illustrate the increase in WBI across NFWT frequency categories. NFWT, negative familial weight talk; WBI, weight bias internalization.

4.2 | Differences by weight status

We are not aware of any other studies in children that have examined the association between NFWT and WBI according to weight status. Our findings indicate that NFWT contributes to elevated WBI levels across the weight spectrum. One study of adolescents found similar results; adolescents with "normal weight", "overweight" and "overweight with binge eating disorder" who experienced parental weight teasing had higher WBI levels compared with adolescents with a similar weight status who never experienced parents weight teasing[56]; however, differences in WBI levels were not examined by weight status.

Weight stigma has a profound influence on the health and well-being of individuals with a higher BMI.[57] Children with BMI ≥85th percentile consistently report more frequent NFWT[8] and weight-based victimization,[58] and have higher WBI levels than children with BMI <85th percentile.[21] Nevertheless, up to 45% of children with BMI <85th percentile report teasing or weight-based commentary from their family members.[5,59] NFWT and its association with WBI among children with BMI <85th percentile has received less attention, but children of any body weight and size may be susceptible to sociocultural factors, such as weight stigma from family, peers and media, which may skew body self-perceptions and negatively influence their body image.[60] Moreover, the *perception* of one's weight and size—sometimes referred to as subjective weight status—may be a stronger determinant of WBI than measured weight.[27] Thus, the health-related correlates of NFWT in children with BMI <85th percentile warrant further study.

4.3 | Differences by race and ethnicity

To our knowledge, this is the first study to examine differences by racial and ethnic backgrounds in the relationship between NFWT to WBI levels in children. We found that WBI levels did not increase significantly across the NFWT frequency categories among non-Hispanic Black and Hispanic children, whereas WBI levels followed a significant dose–response pattern among non-Hispanic White children. Counterintuitively, Hispanic and non-Hispanic Black children in our sample were more likely to report experiencing NFWT often compared with non-Hispanic White children, a pattern observed in other studies as well.[5,17,38,61] Thus, despite experiencing more frequent NFWT, Hispanic and non-Hispanic Black children in our study exhibited less WBI than non-Hispanic White children. Racial and ethnic differences in WBI have been observed in adult and adolescent samples and WBI tends to be lower in Hispanics and non-Hispanic Blacks compared with non-Hispanic Whites and Asians.[25–27,62]

Research that examines the complex ways in which culture and NFWT interact to influence WBI is sparse. Still, studies on parent and child perceptions of weight and NFWT and on racial identity and body image provide some insight. NFWT may have less of an impact on WBI levels in Hispanic and non-Hispanic Black children because weight teasing and comments about weight may be more culturally acceptable and taken less seriously.[63–65] Under such circumstances, some groups may have more vulnerability to WBI in response to NFWT than others. For example, in a study with African American mothers and their adolescent daughters, weight teasing and critical weight comments were often interpreted as playful and as expressions of concern for health, respectively.[63] A separate qualitative study among Latina mothers who had immigrated to the United States (89% born in Mexico, 59% lived in the United States for <15 years) and their adolescent daughters illustrates that daughters more often appeared amused—rather than uncomfortable, non-reactive or negatively affected—when their mothers engaged in weight teasing or made critical remarks about their weight.[64]

Another factor that may have contributed to racial and ethnic differences in WBI levels is that non-Hispanic Black and Hispanic children tend to report a more positive body image and greater body acceptance than non-Hispanic White children,[66–69] which may be protective against WBI.[70] Adolescents and adults who identify as non-Hispanic Black—especially non-Hispanic Black women—exhibit greater satisfaction with their body and physical appearance when compared with non-Hispanic White adolescents and adults; findings among Hispanic men and women are less consistent.[66–69,71] Higher levels of body satisfaction in non-Hispanic Blacks and Hispanics may stem from a body ideal that accommodates larger bodies and is less influenced by Euro-centric beauty standards, which idealize thin bodies. For example, qualitative studies among non-Hispanic Black adults and adolescents suggest that a larger body was perceived as more desirable, muscular and as a signal of strength and beauty, that body size was an inevitable hereditary trait, expressed gratitude for their bodies as it was a "gift from God", and articulated that "being fat" did not equate with poor health.[63,71,72] Somewhat similar themes have been documented in qualitative studies with Hispanics, where larger bodies were perceived as more desirable and as a signal of good health and participants expressed a "fatalist" acceptance of having a higher BMI, given a perceived strong heritability of weight.[73,74] Although non-Hispanic Black and Hispanic children in our study exhibited some resilience to NFWT, it should not be taken as evidence of invulnerability to weight stigma and its health-related correlates, like WBI.

4.4 | Strengths and limitations

This study has several limitations. First, the cross-sectional design limits inferences of causality. However, it seems unlikely that elevated WBI levels would lead to more frequent NFWT. Our study had small sample sizes for the subgroup analysis of non-Hispanic Black and Hispanic children. It is possible that estimates are not representative of WBI in these groups. Furthermore, small sample sizes precluded examination of children who identify with other racial and ethnic groups that are greatly underrepresented in the NFWT and WBI literature (i.e., Asian, American Indian, Alaska Native, Pacific Islander and Multiracial children). Given the heterogeneity of weight stigma experience and idealized body norms across cultures, these sample size limitations highlight the need for larger studies with greater racial and ethnic diversity. NFWT is a complex concept that has been operationalized and measured by researchers in multiple ways, the lack of a consistent definition and standardized measure renders comparisons across studies difficult. We relied on participants' recall of NFWT and self-report of WBI, which may be susceptible to recall and self-report bias. Participants reported NFWT during the past 3 months and so rare occurrences of NFWT may have been overlooked; however, recall may be more accurate over a shorter interval. The NFWT measure focused on comments about excess weight, as a result, the measure may be biased towards the weight and body concerns that are more typical of non-Hispanic White girls and may not fully represent the weight and body concerns of boys, other gender identities, and other racial and ethnic groups. Finally, as this study analysed participants enrolled in a randomized controlled trial in Massachusetts, findings may not be representative of the general population, different parts of the United States or other parts of the world.

Our study has several noteworthy strengths. First, we used a comprehensive NFWT measure that aggregated several types of NFWT from all family members living in the same household, including siblings, to estimate stigmatizing experiences within the home environment. Existing studies have primarily assessed weight teasing or other forms of NFWT (e.g., encouragement to diet) in isolation, focused exclusively on NFWT from parents, or failed to distinguish between immediate and distant relatives (i.e., teasing from *any* family member). Second, we used a three-level ordinal variable for NFWT frequency, which enabled assessment of a dose–response relationship. Finally, our study examined WBI in a racially and ethnically diverse sample of children, and our sample had a distribution of weight status that better reflected levels in the United States compared with existing WBI studies; these elements enhance the generalizability of our findings.

5 | CONCLUSIONS

In this study, more frequent NFWT was associated with higher WBI in a dose–response manner among fifth through seventh graders in Massachusetts. Our findings offer insights about NFWT and its role in contributing to WBI in children and underscore the potential harm of weight stigma across child gender and body weight and among non-Hispanic White children. Our study advances existing knowledge of weight stigma and its implications for children's health, but more work is needed to study NFWT and WBI among children with other gender identities, such as transgender and gender diverse youth, of underrepresented racial and ethnic groups, and within non-Western countries. Longitudinal studies with diverse samples—in terms of race, ethnicity, gender identity and geography—are needed to elucidate the similarities and differences in NFWT and its impact on WBI over time. Such work can help inform the design and feasibility of NFWT prevention strategies and interventions that can build resilience and reduce WBI levels in children and adolescents.

ACKNOWLEDGEMENTS

KMR conceptualized, designed and obtained funding for the study, selected data collection instruments, carried out the statistical analyses and interpretations, drafted the initial manuscript, and critically reviewed and revised the manuscript. RP and AM supervised the design of the study, data interpretations, and critically reviewed and revised the manuscript. ME supervised data collection, statistical analyses, and interpretations and critically reviewed and revised the manuscript. MS supervised the design of the study, oversaw data collection procedures and critically reviewed and revised the manuscript. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work. For their organizational, administrative, material and overall support in the implementation of the SUPPER Project, which made this publication possible, the authors would like to thank Rachael Sabelli, MS (Project Manager, Skeer Lab at Tufts University School of Medicine), Michelle A. Lee-Bravatti, MS MPH (Skeer Lab at Tufts University School of Medicine), Emma C. Ryan, MPH (Senior Research Assistant, Skeer Lab at Tufts University School of Medicine) and undergraduate and graduate research assistants in the Skeer Lab at the Tufts University School of Medicine.

FUNDING INFORMATION

Research reported in this publication was supported by the National Institute of Diabetes and Digestive and Kidney Diseases of the National Institutes of Health (NIH) under Award Number F31DK126399. The SUPPER Project, which provided the study materials and data for the present publication, was supported by the National Institute on Drug Abuse of the NIH under Award Number 1R01DA045073-01A1. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH. The National Institute of Diabetes and Digestive and Kidney Diseases nor the National Institute on Drug Abuse had no role in the design and conduct of the study.

CONFLICT OF INTEREST STATEMENT

Dr. Rancaño received grant support in relation to the submitted work from the National Institute of Diabetes and Digestive and Kidney Diseases of the National Institutes of Health. Dr. Skeer received grant support from the National Institute on Drug Abuse of the National Institutes of Health for the SUPPER Project, which provided the data for this work. Dr. Rancaño was also a Research Assistant for the SUPPER Project. Dr. Puhl receives grant support from Eli Lily & Company outside of the submitted work. The authors have no other disclosures to report.

DATA AVAILABILITY STATEMENT

Basic, Share upon Request: The data that support the findings of this study are available from the corresponding author [KMR], with approval from the SUPPER Project team, upon reasonable request.

ORCID

Katherine M. Rancaño https://orcid.org/0000-0001-7151-287X

REFERENCES

1. Neumark-Sztainer D, Bauer KW, Friend S, Hannan PJ, Story M, Berge JM. Family weight talk and dieting: how much do they matter for body dissatisfaction and disordered eating behaviors in adolescent girls? *J Adolesc Health*. 2010;47(3):270-276. doi:10.1016/j.jadohealth.2010.02.001
2. Puhl RM, Himmelstein MS. Weight bias internalization among adolescents seeking weight loss: implications for eating behaviors and parental communication. *Front Psychol*. 2018;9:2271. doi:10.3389/fpsyg.2018.02271
3. Dahill L, Mitchison D, Morrison N, et al. Prevalence of parental comments on weight/shape/eating amongst sons and daughters in an adolescent sample. *Nutrients*. 2021;13(1):158.
4. Winkler MR, Berge JM, Larson N, Loth KA, Wall M, Neumark-Sztainer D. Parent-child health- and weight-focused conversations: who is saying what and to whom? *Appetite*. 2018;126:114-120. doi:10.1016/j.appet.2018.03.023
5. Berge JM, MacLehose RF, Loth KA, Eisenberg ME, Fulkerson JA, Neumark-Sztainer D. Parent-adolescent conversations about eating, physical activity and weight: prevalence across sociodemographic characteristics and associations with adolescent weight and weight-related behaviors. *J Behav Med*. 2015;38(1):122-135. doi:10.1007/s10865-014-9584-3
6. Puhl RM, Lessard LM. Weight stigma in youth: prevalence, consequences, and considerations for clinical practice. *Curr Obes Rep*. 2020;9(4):402-411. doi:10.1007/s13679-020-00408-8
7. Dahill LM, Touyz S, Morrison N, Hay P. Parental appearance teasing in adolescence and associations with eating problems: a systematic review. *BMC Public Health*. 2021;21(1):1-13.
8. Yourell JL, Doty JL, Beauplan Y, Cardel MI. Weight-talk between parents and adolescents: a systematic review of relationships with health-related and psychosocial outcomes. *Adolescent Res Rev*. 2021;6(4):409-424. doi:10.1007/s40894-021-00149-2
9. Gillison FB, Lorenc AB, Sleddens EFC, Williams SL, Atkinson L. Can it be harmful for parents to talk to their child about their weight? A meta-analysis. *Prev Med*. 2016;93:135-146. doi:10.1016/j.ypmed.2016.10.010
10. Puhl RM, Lessard LM, Foster GD, Cardel MI. A comprehensive examination of the nature, frequency, and context of parental weight communication: perspectives of parents and adolescents. *Nutrients*. 2022;14(8):1-31. doi:10.3390/nu14081562
11. Gmeiner MS, Warschburger P. Intrapersonal predictors of weight bias internalization among elementary school children: a prospective analysis. *BMC Pediatr*. 2020;20(1):1-9.
12. Ciupitu-Plath C, Wiegand S, Babitsch B. The weight bias internalization scale for youth: validation of a specific tool for assessing internalized weight bias among treatment-seeking German adolescents with overweight. *J Pediatr Psychol*. 2018;43(1):40-51. doi:10.1093/jpepsy/jsx079
13. Zuba A, Warschburger P. The role of weight teasing and weight bias internalization in psychological functioning: a prospective study among school-aged children. *Eur Child Adolesc Psychiatry*. 2017;26(10):1245-1255. doi:10.1007/s00787-017-0982-2
14. Zuba A, Warschburger P. Weight bias internalization across weight categories among school-aged children. Validation of the weight bias internalization scale for children. *Body Image*. 2018;25:56-65. doi:10.1016/j.bodyim.2018.02.008
15. van den Berg P, Neumark-Sztainer D, Eisenberg ME, Haines J. Racial/ethnic differences in weight-related teasing in adolescents. *Obesity*. 2008;16:S3-S10. doi:10.1038/oby.2008.445
16. Pötzsch A, Rudolph A, Schmidt R, Hilbert A. Two sides of weight bias in adolescent binge-eating disorder: adolescents' perceptions and maternal attitudes. *Int J Eating Disord*. 2018;51(12):1339-1345.
17. Eisenberg ME, Puhl R, Areba EM, Neumark-Sztainer D. Family weight teasing, ethnicity and acculturation: associations with well-being among Latinx, Hmong, and Somali adolescents. *J Psychosom Res*. 2019;122:88-93. doi:10.1016/j.jpsychores.2019.04.007
18. Hooper L, Puhl RM, Eisenberg ME, Berge JM, Neumark-Sztainer D. Can family and parenting factors modify the impact of weight stigma on disordered eating in young people? A population-based longitudinal study. *J Adolesc Health*. 2023;73:44-52.
19. Puhl RM, Himmelstein MS, Watson RJ. Weight-based victimization among sexual and gender minority adolescents: findings from a diverse national sample. *Pediatr Obes*. 2019;14(7):e12514. doi:10.1111/ijpo.12514
20. Voelker DK, Reel JJ, Greenleaf C. Weight status and body image perceptions in adolescents: current perspectives. *Adolesc Health Med Ther*. 2015;6:149-158. doi:10.2147/AHMT.S68344
21. Pearl RL, Puhl RM. Weight bias internalization and health: a systematic review. *Obes Rev*. 2018;19(8):1141-1163. doi:10.1111/obr.12701
22. Roberto CA, Sysko R, Bush J, et al. Clinical correlates of the weight bias internalization scale in a sample of obese adolescents seeking bariatric surgery. *Obesity*. 2012;20(3):533-539. doi:10.1038/oby.2011.123

23. Romano KA, Heron KE, Sandoval CM, Howard LM, MacIntyre RI, Mason TB. A meta-analysis of associations between weight bias internalization and conceptually-related correlates: a step towards improving construct validity. *Clin Psychol Rev*. 2022;92:102127.
24. Bidstrup H, Brennan L, Kaufmann L, de la Piedad GX. Internalised weight stigma as a mediator of the relationship between experienced/perceived weight stigma and biopsychosocial outcomes: a systematic review. *Int J Obes (Lond)*. 2022;46(1):1-9.
25. Lessard LM, Puhl RM, Foster GD, Cardel MI. Parental communication about body weight and adolescent health: the role of positive and negative weight-related comments. *J Pediatr Psychol*. 2023;48:700-706.
26. Pearl RL, Himmelstein MS, Puhl RM, Wadden TA, Wojtanowski AC, Foster GD. Weight bias internalization in a commercial weight management sample: prevalence and correlates. *Obes Sci Pract*. 2019;5:342-353. doi:10.1002/osp4.354
27. Puhl RM, Himmelstein MS, Quinn DM. Internalizing weight stigma: prevalence and sociodemographic considerations in US adults. *Obesity (Silver Spring)*. 2018;26(1):167-175. doi:10.1002/oby.22029
28. Fields LC, Brown C, Skelton JA, Cain KS, Cohen GM. Internalized weight bias, teasing, and self-esteem in children with overweight or Obesity. *Child Obes*. 2021;17(1):43-50. doi:10.1089/chi.2020.0150
29. Klimek P, Murray SB, Brown T, Gonzales M IV, Blashill AJ. Thinness and muscularity internalization: associations with disordered eating and muscle dysmorphia in men. *Int J Eating Disord*. 2018;51(4):352-357.
30. Murray SB, Nagata JM, Griffiths S, et al. The enigma of male eating disorders: a critical review and synthesis. *Clin Psychol Rev*. 2017;57:1-11.
31. Puhl RM, Lessard LM. Weight stigma in youth: prevalence, consequences, and considerations for clinical practice. *Curr Obes Rep*. 2020;9(4):402-411. doi:10.1007/s13679-020-00408-8
32. Romano KA, Heron KE, Henson JM. Examining associations among weight stigma, weight bias internalization, body dissatisfaction, and eating disorder symptoms: does weight status matter? *Body Image*. 2021;37:38-49.
33. Lawrence SE, Lessard LM, Puhl RM, Foster GD, Cardel MI. "Look beyond the weight and accept me": adolescent perspectives on parental weight communication. *Body Image*. 2023;45:11-19.
34. Puhl RM, Lessard LM, Pudney EV, Foster GD, Cardel MI. Motivations for engaging in or avoiding conversations about weight: adolescent and parent perspectives. *Pediatr Obes*. 2022;17(12):e12962.
35. Gmeiner MS, Warschburger P. Intrapersonal predictors of weight bias internalization among elementary school children: a prospective analysis. *BMC Pediatr*. 2020;20(1):408. doi:10.1186/s12887-020-02264-w
36. Skeer MR, Sabelli RA, Rancaño KM, et al. Randomized controlled trial to test the efficacy of a brief, communication-based, substance use preventive intervention for parents of adolescents: protocol for the SUPPER project (substance use prevention promoted by eating family meals regularly). *PloS One*. 2022;17(2):e0263016.
37. Race and National Origin: General Guidance. 2023. https://www.nih.gov/nih-style-guide/race-national-origin
38. Puhl RM, Wall MM, Chen C, Bryn Austin S, Eisenberg ME, Neumark-Sztainer D. Experiences of weight teasing in adolescence and weight-related outcomes in adulthood: a 15-year longitudinal study. *Prev Med*. 2017;100:173-179. doi:10.1016/j.ypmed.2017.04.023
39. Puhl RM, Himmelstein MS. A word to the wise: adolescent reactions to parental communication about weight. *Childhood Obesity*. 2018;14(5):291-301. doi:10.1089/chi.2018.0047
40. Hart LM, Ferreira KB, Ambwani S, Gibson EB, Austin SB. Developing expert consensus on how to address weight stigma in public health research and practice: a Delphi study. *Stigma Health*. 2021;6(1):79-89. 10.1037/sah0000273
41. Puhl RM. What words should we use to talk about weight? A systematic review of quantitative and qualitative studies examining preferences for weight-related terminology. *Obes Rev*. 2020;21(6):e13008. doi:10.1111/obr.13008
42. CDC. BMI and BMI categories for children and teens. 2023. https://www.cdc.gov/obesity/basics/childhood-defining.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fobesity%2Fchildhood%2Fdefining.html
43. Oliver KK, Thelen MH. Children's perceptions of peer influence on eating concerns. *Behav Ther*. 1996;27(1):25-39. doi:10.1016/S0005-7894(96)80033-5
44. Meyer TA, Gast J. The effects of peer influence on disordered eating behavior. *J Sch Nurs*. 2008;24(1):36-42. doi:10.1177/10598405080240010601
45. Berge JM, Hanson-Bradley C, Tate A, Neumark-Sztainer D. Do parents or siblings engage in more negative weight-based talk with children and what does it sound like? A mixed-methods study. *Body Image*. 2016;18:27-33. doi:10.1016/j.bodyim.2016.04.008
46. Pearl RL, Puhl RM. Measuring internalized weight attitudes across body weight categories: validation of the modified weight bias internalization scale. *Body Image*. 2014;11(1):89-92. doi:10.1016/j.bodyim.2013.09.005
47. Lee MS, Dedrick RF. Weight bias internalization scale: psychometric properties using alternative weight status classification approaches. *Body Image*. 2016;17:25-29. doi:10.1016/j.bodyim.2016.01.008
48. Lindsey JK, Jones B. Choosing among generalized linear models applied to medical data. *Stat Med*. 1998;17(1):59-68.
49. Lawrence SE, Puhl RM, Schwartz MB, Watson RJ, Foster GD. "The most hurtful thing I've ever experienced": a qualitative examination of the nature of experiences of weight stigma by family members. *SSM-Qualit Res Health*. 2022;2:100073.
50. Karazsia BT, Murnen SK, Tylka TL. Is body dissatisfaction changing across time? A cross-temporal meta-analysis. *Psychol Bull*. 2017;143(3):293-320.
51. Kite J, Huang B-H, Laird Y, et al. Influence and effects of weight stigmatisation in media: a systematic. *eClinicalMedicine*. 2022;48:101464.
52. Rancaño KM, Lawrence SE. Health consequences of familial negative weight talk across the Spectrum of gender diversity. *Curr Nutr Rep*. 2023;12:1-13.
53. Baker JH, Higgins Neyland MK, Thornton LM, et al. Body dissatisfaction in adolescent boys. *Dev Psychol*. 2019;55(7):1566-1578. doi:10.1037/dev0000724
54. Mitchell L, Murray SB, Cobley S, et al. Muscle dysmorphia symptomatology and associated psychological features in bodybuilders and non-bodybuilder resistance trainers: a systematic review and meta-analysis. *Sports Med*. 2017;47:233-259.
55. Tylka TL. Models of body image for boys and men. In: Nagata JM, Brown TA, Murray SB, Lavender JM, eds. *Eating Disorders in Boys and Men*. Springer; 2021:7-20.
56. Poetzsch A, Rudolph A, Schmidt R, Hilbert A. Two sides of weight bias in adolescent binge-eating disorder: Adolescents' perceptions and maternal attitudes. *Int J Eating Disord*. 2018;51(12):1339-1345. doi:10.1002/eat.22982
57. Haqq AM, Kebbe M, Tan Q, Manco M, Salas XR. Complexity and stigma of pediatric obesity. *Childhood Obes*. 2021;17(4):229-240. doi:10.1089/chi.2021.0003
58. Pont SJ, Puhl R, Cook SR, Slusser W, Obesity SO, Society TO. Stigma experienced by children and adolescents with Obesity. *Pediatrics*. 2017;140(6):e20173034. doi:10.1542/peds.2017-3034
59. McCormack LA, Laska MN, Gray C, Veblen-Mortenson S, Barr-Anderson D, Story M. Weight-related teasing in a racially diverse sample of sixth-grade children. *J Am Diet Assoc*. 2011;111(3):431-436.
60. Paxton S, Damiano S. The development of body image and weight bias in childhood. *Adv Child Dev Behav*. 2017;52:269-298.

61. Klinck M, Vannucci A, Fagle T, Ohannessian CM. Appearance-related teasing and substance use during early adolescence. *Psychol Addict Behav*. 2020;34(4):541-548. doi:10.1037/adb0000563
62. Himmelstein MS, Puhl RM, Quinn DM. Intersectionality: an understudied framework for addressing weight stigma. *Am J Prev Med*. 2017; 53(4):421-431. doi:10.1016/j.amepre.2017.04.003
63. Pope M, Corona R, Belgrave FZ. Nobody's perfect: a qualitative examination of African American maternal caregivers' and their adolescent girls' perceptions of body image. *Body Image*. 2014;11(3): 307-317.
64. Romo LF, Mireles-Rios R. Latina immigrant mother–daughter communication about their body self-esteem and weight dissatisfaction: an exploratory video-observational study. *J Latin Psychol*. 2016;4(1): 18-31.
65. Berge JM, Trofholz A, Fong S, Blue L, Neumark-Sztainer D. A qualitative analysis of parents' perceptions of weight talk and weight teasing in the home environments of diverse low-income children. *Body Image*. 2015;15:8-15. doi:10.1016/j.bodyim.2015.04.006
66. Frederick DA, Reynolds TA, Barrera CA, Murray SB. Demographic and sociocultural predictors of face image satisfaction: the US body project I. *Body Image*. 2022;41:1-16.
67. Frederick DA, Garcia JR, Gesselman AN, Mark KP, Hatfield E, Bohrnstedt G. The happy American body 2.0: predictors of affective body satisfaction in two US national internet panel surveys. *Body Image*. 2020;32:70-84.
68. Kronenfeld LW, Reba-Harrelson L, Von Holle A, Reyes ML, Bulik CM. Ethnic and racial differences in body size perception and satisfaction. *Body Image*. 2010;7(2):131-136.
69. Mikolajczyk RT, Iannotti RJ, Farhat T, Thomas V. Ethnic differences in perceptions of body satisfaction and body appearance among US schoolchildren: a cross-sectional study. *BMC Public Health*. 2012;12: 1-9.
70. Dunaev J, Markey CH, Brochu PM. An attitude of gratitude: the effects of body-focused gratitude on weight bias internalization and body image. *Body Image*. 2018;25:9-13.
71. Ricciardelli LA, McCabe MP, Williams RJ, Thompson JK. The role of ethnicity and culture in body image and disordered eating among males. *Clin Psychol Rev*. 2007;27(5):582-606.
72. Burk BN. Black girls' perceptions of health and ideal body types. *J Gender Stud*. 2015;24(5):496-511.
73. Romo LF, Mireles-Rios R, Hurtado A. Cultural, Media, and peer influences on body beauty perceptions of Mexican American adolescent girls. *J Adolesc Res* 2016;31(4):474–501. doi:10.1177/0743558415594424
74. Martinez SM, Rhee KE, Blanco E, Boutelle K. Latino mothers' beliefs about child weight and family health. *Public Health Nutr*. 2017;20(6): 1099-1106.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Rancaño KM, Puhl R, Skeer M, Eliasziw M, Must A. Negative familial weight talk and weight bias internalization in a US sample of children and adolescents. *Pediatric Obesity*. 2024;e13108. doi:10.1111/ijpo.13108