

# Weight-based victimization from friends and family: implications for how adolescents cope with weight stigma

M. S. Himmelstein<sup>1</sup>  and R. M. Puhl<sup>1,2</sup> 

<sup>1</sup>Rudd Center for Food Policy and Obesity, University of Connecticut, Hartford, CT, USA;

<sup>2</sup>Department of Human Development and Family Studies, University of Connecticut, Storrs, CT, USA

Address for correspondence: M Himmelstein, PhD, Rudd Center for Food Policy and Obesity University of Connecticut, One Constitution Plaza, Suite 600, Hartford, CT 06103, USA. E-mail: mary.himmelstein@gmail.com

Received 27 February 2018; revised 29 May 2018; accepted 8 June 2018

## Summary

**Background:** Youth with overweight and obesity commonly experience weight-based victimization. The ways that these youth cope with victimization can adversely impact their health. Despite considerable evidence that family members and friends are common perpetrators of weight-based victimization, the relationships among different sources of victimization and coping responses of youth are unknown.

**Objectives:** The present study examined the relationships between weight-based victimization from four sources (friends, peers, family members and teachers) and stigma-specific coping responses in adolescents using linear regression.

**Methods:** Adolescents (ages 13–18 years;  $N = 148$ ) enrolled in a national weight loss camp completed questionnaires about demographics, weight bullying, sources of teasing and internalized weight bias.

**Results:** Teasing sources explained a large proportion of the variance in coping strategies for weight-based victimization. Weight teasing from friends was associated with greater frequency of negative emotions. Weight teasing from peers and friends were associated with greater frequency of coping via avoidance behaviours, while teasing from family was associated with fewer avoidance behaviours. Adolescents reported wanting more support from parents and stronger school policies to address weight-bullying.

**Conclusions:** These results suggest associations between weight-teasing sources and coping mechanisms. Interventions should examine the role of coping strategies to protect against adverse health effects of weight-based victimization.

**Keywords:** Bullying, coping, internalization, weight stigma.

## Introduction

Weight-based victimization is a common experience for many adolescents, particularly those with obesity who comprise 20% of the US adolescent population (1–8). Girls report more weight-based victimization than boys (9,10), as do adolescents with overweight and obesity compared with peers with lower body weight (5,10–12). Experiences of weight-based victimization are not isolated incidents, and many adolescents report these experiences as ongoing, lasting a year or more (1). Of concern, friends, family members and peers are some of the most common sources of weight-based victimization, leaving adolescents vulnerable (1,3,9,13).

Weight-based victimization is associated with poor emotional and physical health. In response to acute experiences of weight-based victimization, adolescents report sadness, depressed mood and fear (2); high school students report feeling less safe than peers who are not bullied about their weight. Weight-based victimization in adolescents is also associated with increased risk for psychological distress (depression, anxiety, poor body image and suicidality) (14,15), disordered eating behaviours (binge eating and eating disorder symptoms) (16,17), physical activity avoidance and lower levels of sports participation (10,16,17). Health consequences of weight-based victimization have long-term impacts. For example, reports of weight-based

victimization in adolescence have been longitudinally associated with binge eating at a 1-year follow-up (18), lower self-esteem, decreased body satisfaction and depression at a 5-year follow up (17), and obesity, restrictive dieting, lower body satisfaction scores and unhealthy weight control at a 15-year follow-up (9). Thus, early experiences of weight-based victimization may have negative implications for emotional and physical health in adulthood.

In addition to experiences with weight-based victimization, weight bias internalization occurs when weight stigma becomes self-directed; individuals recognize that they belong to a stigmatized group, and stereotype and devalue themselves because of their body weight (19,20). Among adults, recent research has demonstrated independent associations between weight bias internalization and depression (21–23), body dissatisfaction, (21,22) binge eating (21,23,24), quality of life (25) and metabolic syndrome (26). Comparatively few studies have examined weight bias internalization in adolescents. Among school children, weight bias internalization has been associated with restrained eating as well as poor emotional functioning 2 years later; weight bias internalization explained the relationship between weight status and these outcomes (27). Among treatment seeking youth with overweight (24) and obesity (28), weight bias internalization was associated with binge eating (24), disordered eating (24), depression (28), anxiety (28) and body-weight concerns (28). Studies have yet to assess the relationship between early weight-based victimization and weight-bias internalization or the unique role each of these has on coping strategies for dealing with victimization.

Coping strategies for dealing with weight stigma play an important role in health (29). Previous literature suggests that the ways individuals cope with stigma may explain the relationship between experiences of weight stigma and a number of health outcomes (29,30). Common strategies for coping with weight stigma among adults involve eating food to cope with stress, experiencing negative affect and avoidance behavior (31,32). Adolescents report similar strategies for coping with weight-based victimization including avoidance (e.g. avoiding social interaction) (2,4,10) and increased eating (2,9); common responses to weight-based victimization include negative affect (e.g. anger and shame) (2,13), and attempting to ignore the situation (2,13). A recent longitudinal study linked weight-based victimization from peers and family members in adolescence to eating as a coping strategy for dealing with stress in adulthood 15 years later (9). Understanding situations associated with stigma-specific coping may be essential to minimizing

adverse health consequences of weight-based victimization.

Despite an increasing literature examining coping strategies and responses to weight-based victimization, absent from the literature are studies examining characteristics associated with adolescents' use of particular coping strategies for and responses to weight stigma. Additionally, few studies have examined associations between different sources of weight-based victimization (i.e. peers, family members, friends and teachers) and adolescent coping strategies. This is especially true for adolescents seeking weight loss treatment, who are particularly vulnerable to weight-based victimization because of their higher body weight (1). Thus, we know little about the reasons why some adolescents respond to weight stigma in ways that are harmful versus protective for their emotional well-being and health. Further, while limited research suggests that adolescents (12,18) and parents (33–35) support policies to address weight-based victimization in schools, few studies examine adolescent perspectives on what specific strategies may help them cope with weight-based victimization in their daily lives (12). Inclusion of adolescent perspectives on these issues and understanding which strategies are associated with different kinds of victimization are key to help inform supportive interventions for this vulnerable population.

To better understand factors that may influence responses and coping strategies for dealing with weight stigma, the present study examined relationships between frequency of weight-based victimization from different sources and responses to weight-based victimization, as well as coping strategies used in response to weight stigma among adolescents enrolled in a weight loss camp. We examined associations between responses to weight-based victimization, as well as coping strategies for weight-based victimization as a function of body weight, internalized weight bias and frequency of weight-based victimization from peers, teachers, friends and family. These variables were chosen because previous literature suggests that sources of weight-based victimization (e.g. peers or family members) in adolescence influence weight-related outcomes in young adulthood (9), yet no literature has examined how different sources might be associated with stigma-specific coping. We examined sources of weight-based victimization and weight bias internalization because previous work suggests that these variables make unique contributions to health (19,20,36). Finally, we also assessed adolescents' perspectives of specific strategies to help them effectively cope with weight-

based victimization. We expected both sources of victimization and weight bias internalization to be associated with adolescents' coping responses, but made no assumptions about which sources of victimization would be associated with specific responses and coping strategies endorsed by adolescents.

## Methods

### Participants

In the summer of 2017, 148 adolescents (ages 13–18) enrolled in a national weight loss camp (Camp Shane; located in Arizona, California, Georgia, New York, Texas and Wisconsin) completed this study. Before enrolling in camp, participants were required to undergo a medical exam demonstrating appropriateness of treatment; campers may attend camp for initial weight loss and return in subsequent summers for weight-loss maintenance. During the camp's online registration process, parents were presented with information about the study and consented to allow their adolescent to participate in an optional, anonymous, online survey. A total of 306 enrolled campers were in the eligible age range (459 total enrolled) for participation (13–18 years) and 48.4% ( $N = 148$ ) completed the survey in exchange for a small gift card to an online retailer. Enrolled participants were slightly older (eligible campers:  $M = 15.26$ ,  $SD = 1.63$ ; enrolled:  $M = 15.97$ ,  $SD = 1.25$ ), and more likely to be male (male participants 74 of 100, female participants: 74 of 206); no other demographic differences existed between study participants and those who chose not to enroll. All study procedures were approved by the institutional review board at the University of Connecticut board. Sample characteristics and measures are described in Table 1.

### Procedure and measures

Parents who consented to allow their adolescent to participate shared the online survey with their adolescent, who then assented to participate and completed the survey at his/her leisure. The survey (hosted at qualtrics.com) asked questions about demographics, anthropometrics, bullying experiences, responses to bullying and opinions on strategies that may help adolescents' address bullying.

#### *Demographics and anthropometrics*

Participants answered questions about their age, race/ethnicity, sex, height, weight and subjective weight status. Body mass index (BMI) percentiles for age and sex were calculated by using growth charts available from the Centers for Disease Control

and Prevention (37). Body mass index categories (5th–85th percentiles for age and sex, 85–95th percentiles for age and sex and >95th percentile for age and sex) were constructed for descriptive purposes (Table 1), although BMI percentile was entered as a continuous variable in regression models. For subjective weight status, participants indicated whether they considered themselves to be 'underweight', 'about the right weight', 'overweight' or 'obese'. (38)

#### *Bullying experiences*

All questions on bullying were previously tested in a sample of weight-loss treatment seeking youth (1). Participants indicated how frequently they experienced bullying at school because of their body weight, gender, race/ethnicity, sexuality, religion or disability, on a scale of 1 (*never*) to 5 (*very often*). Using these categories, participants then selected the reason they were most often bullied or teased. Using the same frequency scale (*never* to *very often*), participants indicated how often they were bullied because of their body weight by family members, peers (i.e. classmate of similar age that participants did not know, did not regularly talk to or spend time with), friends (i.e. classmate of similar age whom participants spent time with, talked with or considered a friend) and teachers.

#### *Responses to weight-based victimization*

Adolescents indicated how often they responded to weight-based bullying in the following ways: (1) negative emotions (four items: anger, sad/depressed, feeling worse about themselves and feeling bad about their body,  $\alpha = 0.70$ ) on a scale of 1 (*never*) to 5 (*very often*), (2) indifference (four items: doing nothing, did not bother me, felt the same and ignored it because it did not bother me,  $\alpha = 0.64$ ), (3) coping by engaging in eating (three items: eating more food, binge eating/overeating and comfort eating to feel better,  $\alpha = 0.70$ ) and (4) coping via avoidance (four items: skipping school, skipping class, avoiding gym class and avoiding other people,  $\alpha = 0.66$ ) behaviours. (2)

#### *Weight bias internalization*

Participants responded to 10 items assessing internalized weight bias using the modified version of the Weight Bias Internalization Scale (WBIS-M) (36). The WBIS-M assesses the extent to which individuals apply negative weight-related stereotypes to themselves and blame themselves because of their body weight. This measure has been used previously with

**Table 1** Sample demographics, bullying experiences, sources and responses (N = 148)

|   | <i>M</i> | <i>SD</i> |          |
|---|----------|-----------|----------|
| Age                                       | 15.97    | 1.25      |          |
| Body mass index                           | 27.06    | 4.39      |          |
|   | <i>n</i> | %         |          |
| Race/ethnicity                            |          |           |          |
| White                                     | 134      | 90.6      |          |
| Black                                     | 3        | 2.0       |          |
| Asian                                     | 4        | 2.7       |          |
| Latino                                    | 7        | 4.7       |          |
| Sex                                       |          |           |          |
| Male                                      | 74       | 50.0      |          |
| Female                                    | 74       | 50.0      |          |
| Body mass index category for age and sex  |          |           |          |
| Healthy weight (5th–85th percentiles)     | 42       | 28.4      |          |
| Overweight (85th–95th percentiles)        | 55       | 37.2      |          |
| Obese (>95th percentile)                  | 51       | 34.6      |          |
| Subjective weight                         |          |           |          |
| Underweight                               | 1        | 0.7       |          |
| About the right weight                    | 25       | 17.0      |          |
| Overweight                                | 84       | 57.1      |          |
| Obese                                     | 37       | 25.2      |          |
|   | <i>M</i> | <i>SD</i> | $\alpha$ |
| Frequency of different forms of bullying: |          |           |          |
| Weight                                    | 3.99     | 0.95      |          |
| Gender                                    | 2.31     | 1.13      |          |
| Race                                      | 2.25     | 1.05      |          |
| Sexuality                                 | 2.11     | 1.13      |          |
| Religion                                  | 2.24     | 1.10      |          |
| Weight-based bullying:                    |          |           |          |
| Frequency of bullying by source           |          |           |          |
| Family                                    | 2.56     | 1.14      |          |
| Peers                                     | 3.66     | 0.98      |          |
| Friends                                   | 2.66     | 1.01      |          |
| Teachers                                  | 2.39     | 1.01      |          |
| Responses to bullying                     |          |           |          |
| Negative emotions                         | 3.48     | 0.67      | 0.70     |
| Indifference                              | 2.83     | 0.66      | 0.64     |
| Coping via eating                         | 3.27     | 0.68      | 0.70     |
| Coping via avoidance                      | 3.13     | 0.63      | 0.66     |
|   | <i>n</i> | %         |          |
| Primary reason for bullying               |          |           |          |
| Body weight                               | 87.00    | 58.80     |          |
| Gender                                    | 5.00     | 3.40      |          |
| Race/ethnicity                            | 19.00    | 12.80     |          |
| Sexuality                                 | 27.00    | 18.20     |          |
| Religion                                  | 4.00     | 2.70      |          |
| Disability                                | 2.00     | 1.40      |          |

samples of youth seeking weight loss treatment (28). Items were rated on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*,  $\alpha = 0.84$ ).

### *Perspectives on strategies to address weight-based bullying*

Participants indicated (yes, no, or maybe) whether they believed 11 different strategies might help adolescents cope with weight-based bullying. Strategies included 'learning from other students what they did when they were teased or bullied' and 'practicing how to react to a bully' (see all items in Table 2). Strategies were based on previous literature assessing support for bullying interventions by students, teachers and parents (2,12,39).

### Analyses

All analyses were conducted by using SPSS version 22.0. Differences in means between adolescent males and females, as well as adolescents with healthy weight versus adolescents with overweight or obesity, were examined via *t* tests. Differences in frequencies

for these groups were examined with chi-square. Because sources of weight-based victimization have been previously identified as being associated with general coping strategies (e.g. using food to cope with stress), we performed linear regressions. Similar results are produced via stepwise regression, and adding sources of weight-based victimization explains significantly more variance in the model than demographics and anthropometrics alone. Linear regressions examined responses (negative affect and indifference) and coping strategies used in response to weight-based bullying (avoidance and eating) as a function of gender, age, race/ethnicity, BMI, subjective weight, weight bias internalization and frequency of bullying experiences from family, peers, friends and teachers.

### Results

Most adolescents (90.5%) identified as White. There were no proportional differences in weight between boys and girls ( $\chi^2 = 4.75$ ,  $p = 0.191$ ), but all adolescents identifying as Hispanic/Latino had a BMI consistent with overweight or obesity ( $\chi^2 = 9.25$ ,  $p = 0.026$ ).

**Table 2** Linear regressions examining coping responses to weight-based bullying

|                             | Responding to bullying with negative emotions |           |         |          |          | Responding to bullying with indifference |           |         |          |          |
|-----------------------------|---|-----------|---------|----------|----------|--|-----------|---------|----------|----------|
|                             | <i>B</i>                                      | <i>SE</i> | $\beta$ | <i>t</i> | <i>p</i> | <i>B</i>                                 | <i>SE</i> | $\beta$ | <i>t</i> | <i>p</i> |
| Female (ref male)           | 0.22  | 0.10      | 0.16    | 2.19     | 0.030    | 0.10                                     | 0.10      | 0.08    | 0.99     | 0.324    |
| Age                         | 0.00  | 0.04      | 0.00    | 0.04     | 0.971    | 0.02                                     | 0.04      | 0.04    | 0.54     | 0.589    |
| White (ref non-White)       | 0.15  | 0.15      | 0.06    | 0.97     | 0.332    | -0.18                                    | 0.16      | -0.08   | -1.16    | 0.248    |
| Body mass index percentile  | 0.01  | 0.00      | 0.14    | 1.70     | 0.092    | -0.01                                    | 0.00      | -0.18   | -2.01    | 0.046    |
| Subjective weight           | 0.06  | 0.07      | 0.06    | 0.89     | 0.377    | 0.22                                     | 0.08      | 0.22    | 2.91     | 0.004    |
| Weight bias internalization | 0.48  | 0.07      | 0.62    | 6.67     | <0.001   | -0.05                                    | 0.07      | -0.07   | -0.70    | 0.487    |
| Bullying source             |   |           |         |          |          |  |           |         |          |          |
| Family                      | -0.03   | 0.04      | -0.05   | -0.70    | 0.486    | 0.11                                     | 0.04      | 0.19    | 2.51     | 0.013    |
| Peers                       | -0.04   | 0.07      | -0.06   | -0.61    | 0.540    | -0.05                                    | 0.06      | -0.07   | -0.73    | 0.468    |
| Friends                     | 0.15  | 0.05      | 0.22    | 2.93     | 0.004    | 0.29                                     | 0.05      | 0.44    | 5.46     | <0.001   |
| Teachers                    | -0.09   | 0.05      | -0.14   | -1.84    | 0.069    | 0.08                                     | 0.05      | 0.12    | 1.55     | 0.123    |
|                             |   |           |         |          |          |  |           |         |          |          |
|                             | Coping with bullying via avoidance            |           |         |          |          | Coping with bullying via eating          |           |         |          |          |
|                             | <i>B</i>                                      | <i>SE</i> | $\beta$ | <i>t</i> | <i>p</i> | <i>B</i>                                 | <i>SE</i> | $\beta$ | <i>t</i> | <i>p</i> |
| Female (ref male)           | 0.19  | 0.10      | 0.16    | 1.87     | 0.064    | 0.20                                     | 0.11      | 0.15    | 1.89     | 0.060    |
| Age                         | 0.06  | 0.04      | 0.12    | 1.47     | 0.144    | 0.00                                     | 0.04      | 0.01    | 0.08     | 0.936    |
| White (ref non-White)       | 0.04  | 0.16      | 0.02    | 0.23     | 0.820    | 0.22                                     | 0.16      | 0.10    | 1.36     | 0.177    |
| Body mass index percentile  | 0.00  | 0.00      | -0.06   | -0.63    | 0.530    | 0.00                                     | 0.00      | -0.05   | -0.60    | 0.548    |
| Subjective weight           | 0.19  | 0.08      | 0.21    | 2.59     | 0.011    | 0.14                                     | 0.08      | 0.14    | 1.80     | 0.073    |
| Weight bias internalization | 0.28  | 0.07      | 0.39    | 3.95     | <0.001   | 0.55                                     | 0.08      | 0.70    | 7.02     | <0.001   |
| Bullying source             |   |           |         |          |          |  |           |         |          |          |
| Family                      | -0.10   | 0.04      | -0.19   | -2.42    | 0.017    | -0.04                                    | 0.04      | -0.06   | -0.80    | 0.426    |
| Peers                       | 0.13  | 0.06      | 0.20    | 1.99     | 0.049    | -0.23                                    | 0.07      | -0.32   | -3.06    | 0.003    |
| Friends                     | 0.25  | 0.05      | 0.40    | 4.80     | 0.000    | 0.07                                     | 0.05      | 0.10    | 1.26     | 0.209    |
| Teachers                    | 0.08  | 0.05      | 0.13    | 1.63     | 0.105    | -0.12                                    | 0.05      | -0.18   | -2.31    | 0.023    |



The average BMI was 27.06 ( $SD = 4.39$ ). Approximately equal thirds of the sample had a BMI percentile for age and sex consistent with healthy weight (28.4%), overweight (37.2%) or obesity (34.5%). Girls were more likely to have a BMI consistent with healthy weight than boys ( $\chi^2 = 26.07, p = 0.001$ ). Adolescents at with a healthy weight either attended the camp for weight loss maintenance or completed the survey after attending camp. Approximately half of the sample perceived themselves as having overweight (57.1%), and 25.2% characterized themselves as having obesity; girls were more likely to perceive themselves as having obesity, while boys were more likely to perceive themselves as having overweight ( $\chi^2 = 4.80, p = 0.002$ ). One participant felt underweight and 17% felt 'about the right weight'.

Frequency of bullying, sources of weight-based teasing and stigma-specific responses and coping strategies are presented in Table 1. Most participants (58.8%) indicated body weight as the primary reason for being bullied at school. A smaller proportion of students indicated sexuality (18.2%) or race/ethnicity (12.8%) as the primary reason they experienced bullying. No differences by gender emerged as a function of primary bullying source ( $\chi^2 = 12.64, p = 0.073$ ), but participants with overweight or obesity were more likely to report weight as the primary reason for bullying compared with adolescents at a healthy weight ( $\chi^2 = 20.51, p = 0.005$ ). Weight-based bullying was reported as the most frequent form of bullying ( $M = 3.99, SD = 0.95$ ), followed by gender ( $M = 2.31, SD = 1.13$ ), race ( $M = 2.25, SD = 1.05$ ) and religion ( $M = 2.24, SD = 1.10$ ). Girls reported more frequent bullying for gender ( $t = -3.97, p < 0.001$ ), sexuality ( $t = -3.07, p = 0.003$ ) and disability ( $t = -1.98, p = 0.050$ ); no gender differences emerged for frequency of bullying for weight ( $t = 1.22, p = 0.226$ ), race ( $t = -0.86, p = 0.391$ ) or religion ( $t = 0.82, p = 0.414$ ). Adolescents with overweight or obesity reported greater frequency of bullying for weight relative to adolescents at a healthy weight ( $t = -2.64, p = 0.009$ ); however, adolescents with healthy weight reported greater frequency of bullying for gender ( $t = 3.69, p < 0.001$ ), race ( $t = 4.32, p < 0.001$ ), sexuality ( $t = 2.20, p < 0.001$ ), religion ( $t = 2.36, p = 0.019$ ) and disability ( $t = 5.89, p < 0.001$ ).

Peers ( $M = 3.66, SD = 0.98$ ) were the most frequent source of weight-based teasing, followed by friends ( $M = 2.66, SD = 1.01$ ), family members ( $M = 2.56, SD = 1.14$ ) and teachers ( $M = 2.39, SD = 1.01$ ). Compared with girls, boys reported more frequent weight-based teasing from peers ( $t = 3.20, p = 0.002$ ) and friends ( $t = 2.49, p = 0.014$ ), but no gender differences emerged in frequency of weight-based teasing from

family members ( $t = -0.79, p = 0.431$ ) or teachers ( $t = 0.49, p = 0.628$ ). Adolescents with overweight or obesity reported more frequent weight-based teasing from peers ( $t = -3.79, p < 0.001$ ), but less teasing from friends ( $t = 2.24, p = 0.027$ ) and teachers ( $t = 4.07, p < 0.001$ ) compared with adolescents at a healthy weight. No BMI differences emerged in frequency of weight-based teasing from family ( $t = 1.68, p = 0.096$ ).

Participants reported high levels of weight bias internalization ( $M = 5.45, SD = 0.88$ ), and a high frequency of negative emotions in response to weight-based victimization at school ( $M = 3.48, SD = 0.67$ ). Boys and girls showed equivalent internalization scores ( $t = 0.62, p = 0.535$ ), but adolescents with overweight or obesity had higher scores on weight bias internalization relative to adolescents at a healthy weight ( $t = -3.88, p < 0.001$ ). On a 5-point scale, participants reported average frequencies of 3.27 ( $SD = 0.68$ ) for engaging in eating as a way to cope with weight-based victimization, 3.13 ( $SD = 0.63$ ) for coping via avoidance behaviours, and 2.83 ( $SD = 0.66$ ) for responding to weight-based victimization via indifference. Girls reported more coping via eating than boys ( $t = -2.20, p = 0.030$ ), but no other gender differences emerged in coping strategies or responses to weight stigma. Adolescents with overweight or obesity were more likely to respond to weight-based victimization with negative affect ( $t = -2.54, p = 0.012$ ), but less likely to respond with indifference ( $t = 4.44, p < 0.001$ ) compared with adolescents at a healthy weight. No differences in coping strategies emerged as a function of BMI status.

### Regressions predicting weight-stigma-specific coping

Linear regressions are presented in Table 2. A linear regression on negative emotions in response to weight-based victimization by internalized weight bias, BMI, subjective weight status and sources of weight-based teasing (family, friends, peers and teachers), controlling for gender, race and age, accounted for 48% of the variance in negative emotions ( $F [10, 145] = 12.40, p < 0.001$ ). Only internalized weight bias ( $B = 0.48, p < 0.001$ ) and weight-based teasing from friends ( $B = 0.15, p = 0.004$ ) were significantly associated with experiencing negative emotions in response to weight-based victimization. The model predicting responding to weight-based victimization via indifference accounted for 39% of the variance in indifference ( $F [10, 146] = 8.85, p < 0.001$ ). Weight teasing from family ( $B = 0.11, p = 0.013$ ) and friends ( $B = 0.29, p < 0.001$ ) were associated with greater indifference in response to

weight-based victimization. Although higher subjective weight status was associated with higher scores on indifference ( $B = .022$ ,  $p = 0.004$ ), higher BMI percentiles were associated with lower scores on indifference ( $B = -0.01$ ,  $p = 0.046$ ).

The linear regression on eating to cope with weight-based victimization accounted for 40% of the variance in eating to cope ( $F [10, 145] = 9.16$ ,  $p < 0.001$ ). Weight-based teasing from peers ( $B = -0.23$ ,  $p = 0.003$ ) and teachers ( $B = -0.12$ ,  $p = 0.003$ ) were associated with lower frequency of eating to cope with weight-based victimization. In contrast, weight bias internalization ( $B = 0.55$ ,  $p < 0.001$ ) was associated with greater frequency of eating to cope. Accounting for demographics (gender, age and race/ethnicity), BMI, subjective weight status, weight bias internalization and bullying sources (family, peers and friends teachers) explained 34% of the variance in coping with weight-based victimization by engaging in avoidance behaviours ( $F [10, 146] = 7.01$ ,  $p < 0.001$ ). Weight-based teasing from family members was associated with fewer avoidance behaviours ( $B = -0.10$ ,  $p = 0.017$ ), while subjective weight status ( $B = 0.19$ ,  $p = 0.011$ ), internalized weight bias ( $B = 0.28$ ,  $p < 0.001$ ) and weight-based teasing from peers ( $B = 0.13$ ,  $p = 0.049$ ) and friends ( $B = 0.25$ ,  $p < 0.001$ ) were associated with greater frequency of avoidance behaviours in response to weight-based victimization.

### Adolescent perspectives on supportive intervention strategies

Table 3 depicts adolescents' views about strategies that would help them cope with weight-based

victimization. The largest proportion of adolescents (70.9%) felt that parental support would help them cope with weight-based bullying, followed by stronger policies for weight-bullying at school (55.4%), practicing how to react to bullying (49.3%), learning better coping strategies (48.6%), knowing the steps to report bullying at school (47.3%) and changing classes (47.3%). Switching schools (29.1%) and talking to a teacher (37.2%) were endorsed by the smallest proportion of participants. Compared with girls, boys were more likely to view strategies of learning from other students ( $\chi^2 = 12.13$ ,  $p = 0.002$ ), practicing reacting to a bully ( $\chi^2 = 13.78$ ,  $p = 0.001$ ) or making new friends ( $\chi^2 = 10.73$ ,  $p = 0.001$ ) as being helpful in dealing with bullying. In contrast, girls believed that moving to a new school would help them cope with bullying more than boys ( $\chi^2 = 14.87$ ,  $p = 0.001$ ). Compared with adolescents at a healthy weight, those with overweight or obesity were more likely to think that having more support from parents ( $\chi^2 = 16.83$ ,  $p < 0.001$ ), knowing the steps for reporting bullying ( $\chi^2 = 18.56$ ,  $p < 0.001$ ), practicing how to react to a bully ( $\chi^2 = 10.28$ ,  $p = 0.006$ ) and having stronger school policies ( $\chi^2 = 9.76$ ,  $p = 0.008$ ) would help them cope with weight-based victimization.

### Discussion

Using data from a sample of weight-loss treatment-seeking youth, we found that different sources of weight-based victimization have important associations with adolescents' responses to and coping strategies for dealing with weight-based victimization. Frequency of weight-based teasing from peers, friends, parents

**Table 3** Adolescent perspectives of strategies to address weight-based bullying

|   | Yes |      | Maybe |      | No |      |
|---|-----|------|-------|------|----|------|
|   | N   | %    | N     | %    | No | %    |
| What would help you deal with bullying?                                     |     |      |       |      |    |      |
| Parental support  | 105 | 70.9 | 34    | 23.0 | 8  | 5.4  |
| Stronger policies for weight bullying                                       | 82  | 55.4 | 59    | 39.9 | 6  | 4.1  |
| Practicing how to react to a bully  | 73  | 49.3 | 57    | 38.5 | 17 | 11.5 |
| Learning strategies for how to cope better with teasing/bullying            | 72  | 48.6 | 57    | 38.5 | 17 | 11.5 |
| Knowing what the steps are for how to report bullying at school             | 70  | 47.3 | 62    | 41.9 | 15 | 10.1 |
| Changing to a different class   | 70  | 47.3 | 64    | 43.2 | 13 | 8.8  |
| Spending more time with your friends  | 63  | 42.6 | 72    | 48.6 | 12 | 8.1  |
| Making new or different friends   | 60  | 40.5 | 84    | 56.8 | 3  | 2.0  |
| Learning from other students what they did when they were teased or bullied | 59  | 39.9 | 79    | 53.4 | 9  | 6.1  |
| Having a teacher to talk to at school                                       | 55  | 37.2 | 71    | 48.0 | 21 | 14.2 |
| Going to a new school   | 43  | 29.1 | 75    | 50.7 | 29 | 19.6 |

and teachers accounted for a substantial amount of variance in coping with weight-based victimization. Weight-based teasing from friends was associated with a greater frequency of negative emotions in response to weight-based victimization, and boys reported a greater frequency of teasing from peers and friends relative to girls. Adolescents with overweight or obesity reported more frequent teasing from peers, but less frequent teasing from friends and teachers relative to healthy weight adolescents. More frequent weight teasing from family and friends were associated with greater frequency of acting indifferent. More frequent teasing from peers and teachers were associated with less coping via eating. Girls reported more frequent coping via eating relative to boys, and adolescents with overweight and obesity reported responding to weight-based victimization with negative affect more frequently compared with healthy weight adolescents. Teasing from peers and friends were associated with coping via avoidance.

These findings highlight the importance of considering how different sources of weight-based teasing may influence adolescents' responses and coping strategies in distinct ways. Given that weight-based victimization in adolescence is associated with health consequences in adulthood (9), understanding associations between sources of victimization, responses to victimization and coping strategies are important avenues for future research. Specifically, research is needed to identify the unique aspects of being teased by different sources (e.g. family versus peers) and how these experiences may lead to different forms of stigma-specific responses to victimization and attempts to cope with victimization. From an intervention perspective, understanding responses to weight-based bullying, as well as which coping mechanisms are most effective for adolescents when they experience bullying from different sources, could help determine how coping strategies might be harnessed to buffer against initial responses to stigma as well as the negative health effects of weight bullying.

Similar to previous work (1,12), we found that weight-based victimization was the most common and most frequent form of bullying experienced among weight-loss treatment seeking youth. Boys reported more teasing from peers and friends than girls, and adolescents with overweight or obesity reported a greater frequency of bullying from peers, but less bullying from friends and teachers compared with adolescents at a healthy weight. Responding to weight-based victimization with negative emotions (2,13), coping via eating (2,9) and coping via avoidance (2,4,10) echo previous qualitative and cross-sectional work (2,13). Girls reported a greater frequency of coping via eating relative to boys, and

adolescents with overweight or obesity reported more negative affect and less indifference in response to weight-based victimization compared with adolescents at a healthy weight. This study adds to the limited literature on stigma-specific coping by demonstrating different associations between weight-based teasing and responses as well as coping strategies for dealing with weight-based victimization. For example, while teasing from friends and family members were associated with adolescents responding as indifferent, teasing from friends was associated with attempts to cope by engaging in more avoidance behaviours and responding with negative emotions. Thus, adolescents may react outwardly indifferent to teasing from friends, but experience emotional distress after being teased by them and respond by avoiding school activities. This research indicates that adolescents who are teased about their weight from friends may benefit from interventions to address negative emotional responses and prevent social isolation from peers. While family teasing was associated with less avoidant coping behaviours, measurement of avoidance focused on school activities, rather than in the home environment. Thus, it may be that adolescents engage in family-specific avoidance behaviours that were not captured in this study.

It is noteworthy that internalized weight bias was associated with adolescents responding to weight-based victimization with increased negative emotions, as well as coping via avoidance, and coping via eating. It may be that shaming and blaming oneself for weight has important implications for responses to weight-based victimization as well as the strategies adolescents use to cope with weight-based victimization. Adolescents internalizing weight bias may have heightened risk for maladaptive responses and coping strategies for dealing with weight stigma; increased attention to internalization and its links with coping behaviours in adolescents is warranted. Very few studies have examined weight bias internalization in youth (28,27). Understanding weight bias internalization in adolescents seeking weight-related treatment is an important avenue for future research, particularly given that treatment seeking populations tend to score higher on measures of weight bias internalization (28). Adolescents' BMI and subjective weight status appeared to have opposite associations with their responses to weight-based victimization. Body mass index percentile was associated with less indifference in response to weight-based victimization, while subjective weight status was associated with responding to weight-based victimization with more indifference and coping via avoidance. Clarifying the ways in which measures of



body mass versus subjective weight status differentially predict weight-related health and coping responses may be important for identifying which adolescents (e.g. those with higher subjective weight) may benefit most from supportive interventions that help them cope with victimization.

Increased parental support was endorsed by most adolescents as being important for helping them cope with weight-based bullying. The proportion of adolescents who wanted parental support did not differ between those who were teased by family versus those who were not (results not shown). Previous literature suggests that adolescents, particularly those who are bullied most frequently, do not want parents to intervene on their behalf (12,18), but it may be useful to teach parents effective strategies to help adolescents cope with weight-based victimization in healthy ways. Adolescents also reported that it would be helpful to practice practical strategies like how to react to bullying incidents when they occur and how to report bullying at school; these types of tangible strategies can be incorporated into existing school-based anti-bullying efforts, and potentially in therapy settings where youth can be supported to practice assertive coping.

There are several limitations of this study which should be noted. First, this sample is selective and largely White. Given the expense of commercial weight loss camps, it is unlikely that this sample represents the larger population of adolescents with overweight or obesity or those seeking treatment for weight. Future work should focus on samples that are ethnically and economically diverse. Reports of bullying frequency, in this study, relied on retrospective reports. Although the results we obtained were similar to those found in other studies (1,2,4,9,10,12,13), retrospective reports of coping and bullying are subject to recall bias. Our measures of BMI relied on adolescents self-reporting their weight. While these adolescents were likely aware of their weight given they were weighed prior to and during camp, objective measures are preferable. All of the variables in this study were measured in a single session. Although this study utilized linear regression to examine relationships between sources of weight stigma and stigma-specific coping, these data are cross-sectional in nature and cannot determine causality or directionality in these relationships. Two measures assessing responses to weight-based victimization used in this study had low reliability estimates. Measurement is a general limitation in this area of research, as validated measures that assess weight stigma-specific coping among youth are absent. In addition, this study examined potentially

negative weight-stigma-specific coping strategies. A clear priority for research is the development of improved assessment of stigma-specific coping strategies, which includes both adaptive and maladaptive strategies for coping with weight stigma.

## Conclusions

Approximately 20% of adolescents in the United States have obesity (8), which leaves them vulnerable to weight-based victimization (5,10–12). With considerable evidence documenting health consequences of weight-based victimization (9), it is important to identify common coping strategies that may impact adolescent health. This is particularly evident in light of recent research suggesting that weight-stigma-specific coping may mediate associations between experienced weight stigma and health (29). Findings from the present study suggest that sources of weight-based teasing are associated with different kinds of coping responses to weight-based victimization. It will be important to identify effective coping mechanisms that can be harnessed in youth-based weight interventions to prevent the adverse health effects of weight-based victimization and protect emotional well-being of youth in the face of these distressing experiences.

## Funding source

This research was supported from a donation by the Rudd Foundation.

## Acknowledgements

RMP conceptualized the study. RMP and MSH contributed to the study design. MSH oversaw data collection, carried out data analyses and wrote the initial draft of the manuscript. RMP and MSH revised the manuscript, approved the final manuscript as submitted and agree to be accountable for all aspects of the work. The authors are grateful to Camp Shane for their cooperation and project support, with specific thanks to Ziporah Janowski.

## Conflicts of Interest

The other authors have indicated they have no financial relationships relevant to this article to disclose, but both authors have received research funding from Weight Watchers International to conduct a different study.

## References

- Puhl RM, Peterson JL, Luedicke J. Weight-based victimization: bullying experiences of weight loss treatment-seeking youth. *Pediatrics* 2013; 131: e1–e9. <https://doi.org/10.1542/peds.2012-1106>
- Puhl RM, Luedicke J. Weight-based victimization among adolescents in the school setting: emotional reactions and coping behaviors. *J Youth Adolesc* 2012; 41: 27–40. <https://doi.org/10.1007/s10964-011-9713-z>
- Puhl RM, Luedicke J, Heuer C. Weight-based victimization toward overweight adolescents: observations and reactions of peers. *J Sch Health* 2011; 81: 696–703. <https://doi.org/10.1111/j.1746-1561.2011.00646.x>
- Skrzypiec G, Slee P, Murray-Harvey R, Pereira B. School bullying by one or more ways: does it matter and how do students cope? *Sch Psychol Int* 2011; 32: 288–311. <https://doi.org/10.1177/0143034311402308>
- Haines J, Neumark-Sztainer D, Hannan PJ, Van Den Berg P, Eisenberg ME. Longitudinal and secular trends in weight-related teasing during adolescence. *Obesity* 2008; 16. <https://doi.org/10.1038/oby.2008.447>
- Bucchianeri MM, Eisenberg ME, Neumark-Sztainer D. Weightism, racism, classism, and sexism: shared forms of harassment in adolescents. *J Adolesc Health* 2013; 53: 47–53. <https://doi.org/10.1016/j.jadohealth.2013.01.006>
- Juvonen J, Lessard LM, Schacter HL, Suchilt L. Emotional implications of weight stigma across middle school: the role of weight-based peer discrimination. *J Clin Child Adolesc Psychol* 2017; 46: 150–158. <https://doi.org/10.1080/15374416.2016.1188703>
- NCD Risk Factor Collaboration. Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128·9 million children, adolescents, and adults. *Lancet* 2017; 390: 2627–2642. [https://doi.org/10.1016/S0140-6736\(17\)32129-3](https://doi.org/10.1016/S0140-6736(17)32129-3)
- 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 (Baltim)* 2017; 100: 173–179. <https://doi.org/10.1016/j.ypmed.2017.04.023>
- Faith MS, Leone MA, Ayers TS, Heo M, Pietrobelli A. Weight criticism during physical activity, coping skills, and reported physical activity in children. *Pediatrics* 2002; 110: e23. <https://doi.org/10.1542/peds.110.2.e23>
- Quick V, Wall M, Larson N, Haines J, Neumark-Sztainer D. Personal, behavioral and socio-environmental predictors of overweight incidence in young adults: 10-yr longitudinal findings. *Int J Behav Nutr Phys Act* 2013; 10: 37. <https://doi.org/10.1186/1479-5868-10-37>
- Puhl RM, Peterson JL, Luedicke J. Strategies to address weight based victimization: youths' preferred support interventions from classmates, teachers, and parents. *J Youth Adolesc* 2013; 42: 315–327. <https://doi.org/10.1007/s10964-012-9849-5>
- Neumark-Sztainer D, Story M, Faibisch L. Perceived stigmatization among overweight African-American and Caucasian adolescent girls. *J Adolesc Health* 1998; 23: 264–270. [https://doi.org/10.1016/S1054-139X\(98\)00044-5](https://doi.org/10.1016/S1054-139X(98)00044-5)
- Eisenberg ME, Neumark-Sztainer D, Story M. Associations of weight-based teasing and emotional well-being among adolescents. *Arch Pediatr Adolesc Med* 2003; 157: 733–738. <https://doi.org/10.1001/archpedi.157.8.733>
- Neumark-Sztainer D, Falkner N, Story M, Perry C, Hannan PJ, Mulert S. Weight-teasing among adolescents: correlations with weight status and disordered eating behaviors. *Int J Obes (Lond)* 2002; 26: 123–131. <https://doi.org/10.1038/sj.ijo.0801853>
- Haines J, Neumark-Sztainer D, Eisenberg ME, Hannan PJ. Weight teasing and disordered eating behaviors in adolescents: longitudinal findings from Project EAT (Eating Among Teens). *Pediatrics* 2006; 117: e209–e215. <https://doi.org/10.1542/peds.2005-1242>
- Eisenberg ME, Neumark-Sztainer D, Haines J, Wall M. Weight-teasing and emotional well-being in adolescents: longitudinal findings from Project EAT. *J Adolesc Health* 2006; 38: 675–683. <https://doi.org/10.1016/j.jadohealth.2005.07.002>
- King KM, Puhl RM, Luedicke J, Peterson JL. Eating behaviors, victimization, and desire for supportive intervention among adolescents in weight-loss camps. *Eat Behav* 2013; 14: 484–487. <https://doi.org/10.1016/j.eatbeh.2013.08.004>
- Durso LE, Latner JD. Understanding self-directed stigma: development of the Weight Bias Internalization Scale. *Obesity* 2008; 16: S80–S86. <https://doi.org/10.1038/oby.2008.448>
- Puhl RM, Himmelstein MS, Quinn DM. Internalizing weight stigma: prevalence and sociodemographic considerations in us adults. *Obesity* 2017; 0: 1–9. <https://doi.org/10.1002/oby.22029>
- Carels RA, Burmeister J, Oehlhof MW, et al. Internalized weight bias: ratings of the self, normal weight, and obese individuals and psychological maladjustment. *J Behav Med* 2013; 36: 86–94. <https://doi.org/10.1007/s10865-012-9402-8>
- Durso LE, Latner JD, Ciao AC. Weight bias internalization in treatment-seeking overweight adults: psychometric validation and associations with self-esteem, body image, and mood symptoms. *Eat Behav* 2016; 21: 104–108. <https://doi.org/10.1016/j.eatbeh.2016.01.011>
- O'Brien KS, Latner JD, Puhl RM, et al. The relationship between weight stigma and eating behavior is explained by weight bias internalization and psychological distress. *Appetite* 2016; 102: 70–76. <https://doi.org/10.1016/j.appet.2016.02.032>
- Schvey NA, Roberto CA, White MA. Clinical correlates of the Weight Bias Internalization Scale in overweight adults with binge and purge behaviours. *Adv Eat Disord* 2013; 1: 213–223. <https://doi.org/10.1080/21662630.2013.794523>
- Palmeira L, Pinto-Gouveia J, Cunha M. The role of weight self-stigma on the quality of life of women with overweight and obesity: a multi-group comparison between

- binge eaters and non-binge eaters. *Appetite* 2016; 105: 782–789. <https://doi.org/10.1016/j.appet.2016.07.015>.
26. Pearl RL, Wadden TA, Hopkins CM, *et al.* Association between weight bias internalization and metabolic syndrome among treatment-seeking individuals with obesity. *Obesity* 2017; 25: 317–322. <https://doi.org/10.1002/oby.21716>
27. 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: 1245–1255. <https://doi.org/10.1007/s00787-017-0982-2>.
28. 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: 533–539. <https://doi.org/10.1038/oby.2011.123>
29. Himmelstein MS, Puhl RM, Quinn DM. Weight stigma and health: the mediating role of coping responses. *Health Psychol* 2018; 37: 139–147. <https://doi.org/10.1037/hea0000575>.
30. Hayward LE, Vartanian LR, Pinkus RT. Weight stigma predicts poorer psychological well-being through internalized weight bias and maladaptive coping responses. *Obesity* 2018; 26: 755–761. <https://doi.org/10.1002/oby.22126>.
31. Puhl RM, Brownell KD. Confronting and coping with weight stigma: an investigation of overweight and obese adults. *Obesity* 2006; 14: 1802–1815. <https://doi.org/10.1038/oby.2006.208>.
32. Himmelstein MS, Puhl RM, Quinn DM. Intersectionality: an understudied framework for addressing weight stigma. *Am J Prev Med* 2017. <https://doi.org/10.1016/j.amepre.2017.04.003>.
33. Suh Y, Puhl R, Liu S, Fleming Milici F. Parental support for policy actions to reduce weight stigma toward youth in schools and children's television programs: trends from 2011 to 2013. *Child Obes* 2014; 10: 533–541. <https://doi.org/10.1089/chi.2014.0050>.
34. Puhl RM, Suh Y, Li X. Improving anti-bullying laws and policies to protect youth from weight-based victimization: parental support for action. *Pediatr Obes* 2017; 12: e14–e19. <https://doi.org/10.1111/ijpo.12129>
35. Puhl RM, Luedicke J. Parental support for policy measures and school-based efforts to address weight-based victimization of overweight youth. *Int J Obes (Lond)* 2014; 38: 531–538. <https://doi.org/10.1038/ijo.2013.207>
36. Pearl RL, Puhl RM. Measuring internalized weight attitudes across body weight categories: validation of the modified weight bias internalization scale. *Body Image* 2014; 11: 89–92. <https://doi.org/10.1016/j.bodyim.2013.09.005>.
37. Kuczmarski R, Ogden C, Guo S. 2000 CDC growth charts for the United States: methods and development. *Vital Heal Stat* 2002; 11: 1–203 <http://europecmc.org/abstract/med/12043359>. Accessed March 27, 2015.
38. Himmelstein MS, Incollingo Belsky AC, Tomiyama AJ. The weight of stigma: cortisol reactivity to manipulated weight stigma. *Obesity* 2015; 23: 368–374. <https://doi.org/10.1002/oby.20959>.
39. Sherer YC, Nickerson AB. Anti-bullying practices in American schools: perspectives of school psychologists. *Psychol Sch* 2010; 47: 217–229. <https://doi.org/10.1002/pits>