

BRIEF REPORT

Weight-Based Victimization and School Performance in Adolescence: Can Teachers Help Reduce Academic Risks?

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Weight-based victimization (WBV) is a common and consequential experience for adolescents with overweight and obesity. The current study examined the relative contributions of different school-based sources of WBV (i.e., peers, friends, teachers, coaches) on academic grades, as well as the role of teachers in mitigating the academic consequences of WBV among a sample of 148 adolescents with high body weight ($M_{\text{age}} = 15.97$, $SD_{\text{age}} = 1.25$; 50% female). Regression analyses revealed that the link between school-based WBV and lower grades among adolescents was due primarily to mistreatment from peers. However, this association was weakened when students perceived their teachers to be more helpful in preventing future WBV, but not as a function of how frequently students reported incidents of WBV to their teachers. These findings underscore the importance of teacher intervention in supporting the academic success of adolescents experiencing WBV from their peers in the school setting.

Impact and Implications

The study results suggest that the association between peer weight-based victimization (WBV) and lower academic grades in adolescence may be minimized when students perceive their teachers as resources to help prevent future WBV.

Keywords: weight-based victimization, adolescence, peers, academic performance, teacher support

Weight-based victimization (WBV; i.e., teasing and/or bullying specifically due to body weight) is among the most prevalent forms of harassment that adolescents face at school (Bucchianeri et al., 2013); WBV is especially common among those with overweight and obesity (Puhl et al., 2011) who comprise over a third of secondary school-aged youth in the United States (Fryar et al., 2018). Considerable evidence has documented the direct, adverse implications of WBV for adolescent social, emotional, and physical adjustment (e.g., Juvonen et al., 2017; Puhl et al., 2017). At a time when peer relationships function as a critical academic resource (Juvonen et al., 2012), being repeatedly targeted by peers because of one's weight can also take a significant toll on school performance (Puhl & Luedicke, 2012). Indeed, youth teased about their weight are more likely to receive lower academic grades,

even after accounting for sociodemographic characteristics and weight status (Krukowski et al., 2009). Additionally, a recent study of sexual and/or gender minority (SGM) adolescents found that the negative association between WBV and academic grades was retained over and above other forms of bias-based mistreatment (Lessard et al., 2020). Despite evidence of the school-related consequences of WBV, little is known about the relative contributions of different school-based sources of WBV (i.e., peers, friends, teachers, coaches) on school performance and the potential of teachers to support the academic success of students who are victimized for their weight. Supporting recent calls for research to identify specific ways for teachers to address WBV in the school setting (Puhl et al., 2016), the current investigation examined the extent to which adolescents' perceptions of teacher helpfulness and the frequency with which adolescents report WBV incidents to teachers may mitigate the negative association between WBV and academic grades. We assessed these questions in a sample of adolescents with overweight and obesity seeking weight-loss, who are at heightened vulnerability to WBV (Puhl et al., 2011).

Peers are among the most prevalent perpetrators of WBV at school (Bucchianeri et al., 2013). In fact, over 78% of high school students report observing weight-based peer mistreatment at

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school (Puhl et al., 2011). In addition to peers in general, friends and even adults, such as teachers and coaches, can stigmatize and victimize youth based on their body weight. For example, in one study of weight loss treatment-seeking youth, 70% of adolescents with obesity reported experiencing WBV from friends, 42% reported perpetration by PE coaches, and more than a quarter of students indicated WBV from teachers (Puhl et al., 2013a). Yet, despite evidence of multiple sources of WBV at school, little is known about which sources of school-based WBV may be most academically consequential.

Drawing from the general bullying literature, growing evidence underscores the importance of teacher support for the academic wellbeing of victimized youth (e.g., Konishi et al., 2010). Although one study found that middle school students' perceptions of general support from teachers did not moderate the association between peer weight discrimination and feelings of school connectedness (Golaszewski et al., 2018), teacher intervention and support specifically related to students' WBV experiences may be more effective. For example, it is likely important that students perceive their teachers as allies in preventing future WBV. Indeed, evidence indicates that the majority of weight-loss seeking adolescents desire teacher intervention in WBV, especially those with greater confidence in the helpfulness of teacher intervention (Puhl et al., 2013b). Although student perceptions of teacher helpfulness have been linked to lower levels of generalized victimization (Cortes & Kochenderfer-Ladd, 2014), WBV and its academic consequences could vary depending upon students' perceptions of their teachers' ability to alleviate their plight. Moreover, although teacher intervention in peer victimization relies heavily on students reporting such incidents to them (Novick & Isaacs, 2010) and that adolescents overall are apprehensive to report WBV to teachers (Puhl et al., 2011), barriers to reporting WBV remain unexamined.

To address these significant gaps in extant research, the current study is guided by two main aims. First, extending previous studies linking WBV to underachievement (Krukowski et al., 2009; Lessard et al., 2020), we examine the relative effects of perpetration by peers and other school-based sources (i.e., friends, teachers, coaches) on academic grades. Second, we examine the potential of teachers to mitigate the academic consequences of WBV by testing the moderating effects of perceived teacher helpfulness, as well as the frequency with which adolescents report incidents of WBV to teachers. Given that adolescents with overweight and obesity are particularly vulnerable to WBV (Puhl et al., 2011), we capitalize on a sample of adolescents seeking weight-loss in order to identify potential points of intervention.

Method

Participants

Adolescents (ages 13 to 18) were recruited from a national youth weight-loss camp (i.e., Camp Shane; for details, see www.campshane.com). The program was selected for their large enrollment, numerous program facilities, and participation across the United States (located in Arizona, California, Georgia, New York, Texas, and Wisconsin). Of the 306 eligible (within age range) campers, 48% ($n = 148$) completed the survey and comprised the

analytic sample ($M_{\text{age}} = 15.97$, $SD_{\text{age}} = 1.25$). Fifty percent of the sample identified as female, while self-reported race/ethnicity revealed participants to be 90.6% White, 4.7% Latino, 2.7% Asian, and 2.0% Black. The majority (72%) of participants had a body mass index (BMI) percentile classified as overweight or obese (i.e., ≥ 85 th percentile), whereas the remaining participants with a BMI percentile classified as "healthy" reflect those who had experienced weight loss and were returning to camp for weight-loss maintenance.

Previously published studies drawing on this dataset have focused primarily on adolescent preferences for weight-related communication (Puhl & Himmelstein, 2018a, 2018b), weight bias internalization (Puhl & Himmelstein, 2018c), and coping responses to WBV (Himmelstein & Puhl, 2019). The analyses reported here are the first in this dataset to examine the academic implications of WBV and the role that teachers play in supporting the schooling success of students experiencing WBV.

Procedure

All study procedures were approved by the University of Connecticut Institutional Review Board. Data was collected online via self-report surveys in the summer of 2017. After receiving parental consent and providing assent, adolescents completed a battery of questionnaires (via Qualtrics.com) to assess their experiences of WBV and opinions on strategies that may help adolescents address bullying. To compensate for participation, adolescents received a \$10 Amazon gift card.

Measures

School-Based Experiences of WBV

Participants were provided with a detailed definition of bullying¹ and were asked to indicate whether they have been teased or bullied because of their weight at school by each of the following sources: a peer (i.e., "classmate who is about your age that you don't know well, don't usually talk to nor spend time with"), friend (i.e., "classmate who is about your age that you spend time with, talk to, and who also considers you a friend"), teacher, and PE teacher/sports coach. Responses assessed the frequency of WBV from each source on a 5-point scale ranging from 1 (*never*) to 5 (*very often*). These questions were tested previously in a sample of weight-loss treatment seeking youth (Puhl et al., 2013a).

Roles of Teachers in WBV Intervention

Participants responded to a series of questions to examine their perceptions of teachers' roles in intervening in WBV.

Perceived Helpfulness. Participants were asked how helpful they perceived their teacher would be in preventing future WBV,

¹ Specifically, participants read the following: "What is bullying? Bullying is when a person or group of people intentionally and repeatedly hurt another individual during face-to-face interactions or through technology (i.e., computer or cell phone). This may include being mean, spreading rumors, teasing, harassing, name-calling, insulting, ignoring, excluding, embarrassing, threatening, making fun of someone, or even being physically aggressive. Sometimes, young people are treated in one of these ways because of their appearance, such as their body weight."

using a 5-point scale (1 = *not helpful*, 2 = *a little helpful*, 3 = *somewhat helpful*, 4 = *helpful*, and 5 = *very helpful*).

Reporting Frequency. On a 5-point scale (1 = *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, 5 = *very often*), participants provided the frequency with which they reported incidents of WBV at school to a teacher, principal, or other staff person following such experiences.

Barriers to Reporting. Participants were provided with a list of reasons to indicate why they may not report experiences of WBV to a teacher or staff person (see Table 1). Response items were primarily developed from previous research on WBV (Puhl et al., 2011, 2013a, 2013b; Puhl & Luedicke, 2012) but were also informed by literature on general victimization (e.g., Craig et al., 2007; Crothers et al., 2006).

Grades

Participants were asked to report on their academic grades. Response options were provided on a 4-point ordinal scale ranging from (1) *mostly Ds*, (2) *mostly Cs*, (3) *mostly Bs*, (4) *mostly As*. Due to few participants reporting mostly Ds ($n = 2$), we created a combined mostly Cs/Ds category resulting in a three-point ordinal dependent variable.

Demographics and Anthropometrics

Participants reported their sex at birth, race/ethnicity, and age. In addition, BMI percentile was calculated by using the Centers for Disease Control and Prevention growth charts based on self-reported height, weight, age, and sex (Kuczmarski et al., 2002). Finally, participants' geographic region was measured by coding the location of their camp facility into one of three options: "North," "South," "West."

Analytic Plan

Data analysis proceeded in three steps. First, we examined descriptive information regarding adolescents' school-based experiences of WBV, their frequency of reporting WBV to teachers, and perceived teacher helpfulness. Second, associations between different school-based sources of WBV and academic grades were tested. Given the ordinal nature of academic grades, ordinal regression models were specified using maximum likelihood estimation and a Monte Carlo integration algorithm. Whereas the continuous modeling of ordinal data can lead to incorrect standard errors (Dolan, 1994), ordinal regression models more accurately account for the measurement level and produce unbiased estimates

(Huang et al., 2009). We conducted a series of moderation analyses to test whether the effect of WBV on academic grades varies as a function of the perceived helpfulness of teachers, or frequency of reporting WBV to teachers. Results were reported as odds ratios (ORs) with 95% confidence intervals (CIs). Statistically significant interactions were decomposed to compare the effect of WBV on academic grades for students one standard deviation below, at, and one standard deviation above the mean of the moderating variable (i.e., teacher helpfulness, WBV reporting frequency). All regression models were tested in Mplus 8.0 (Muthén & Muthén, 1998–2017) and controlled for sex (0 = male, 1 = female), race/ethnicity (0 = White, 1 = non-White), geographic region (reference group = North, as the largest group in the sample), and age. Continuous covariates (e.g., BMI) and independent variables (e.g., WBV) were grand-mean centered to facilitate interpretation. A single case of item nonresponse missing data in each of the regression analyses was handled using listwise deletion ($n = 147$ of 148).

Results

Descriptive Information

Peers were the most frequent source of WBV in the school setting ($M = 3.66$, $SD = .98$), followed by friends ($M = 2.66$, $SD = 1.01$), PE/sports coaches ($M = 2.57$, $SD = .94$), and teachers ($M = 2.39$, $SD = 1.01$). In fact, almost all (98%) participants reported at least one incident of peer WBV (i.e., not "never"). School-based WBV from other sources was also widespread, with 93% percent of participants indicating at least one incident of WBV (i.e., not "never") from friends, followed by 86% and 78% who reported that their PE/sports coaches and teachers, respectively, bullied them about their weight at least "rarely."

A series of t -tests were conducted using a Bonferroni adjustment ($\alpha = .0125$) to examine sex differences in the frequency of school-based WBV across interpersonal sources. Boys reported experiencing WBV from peers more often than did girls, $t(146) = 3.20$, $p = .002$; in contrast, frequency reports of WBV from friends, PE/sports coaches, and teachers were similar for boys and girls. Additionally, bivariate correlations with a Bonferroni adjustment ($\alpha = .0125$) revealed nonsignificant age differences in frequency of WBV across interpersonal sources, except for WBV from peers, which was negatively associated with age ($r = -.27$, $p = .001$).

Fewer than 20% of students perceived their teachers to be *helpful* or *very helpful* in preventing future weight-based bullying, and fewer than one in five students indicated that they had reported incidents of WBV *often* or *very often* to teachers. Table 1 displays the extent to which students endorsed explanations for not reporting peer WBV to a teacher or staff person at school. Most of the sample (70%) indicated not wanting "to make the situation worse," and more than half (55%) avoided reporting peer WBV because they "didn't want to be a tattletale/snitch." Notably, one third (34%) of students were "scared" to report peer WBV, and 17% indicated that "teachers/staff don't do anything—the situation will just continue."

Table 1
Adolescent-Endorsed Explanations for Not Reporting Weight-Based Victimization to Teachers

Barriers to reporting	% Endorsing
I didn't want to make the situation worse.	70.3%
I didn't want to be a tattletale/snitch.	54.7%
I handled the situation by myself.	43.2%
I was scared.	33.8%
It's not a big deal, it's not important.	25.7%
It was just a joke.	18.9%
Teachers/staff don't do anything—the situation will just continue.	16.9%

Table 2
Regression (Ordinal) of Academic Grades on Weight-Based Victimization From Different Interpersonal Sources at School

Predictor	OR	95% CI
Sex ^a		
Female	0.942	[0.421, 2.109]
Race/ethnicity ^b		
Non-White	0.458	[0.123, 1.703]
Region ^c		
West	2.615*	[1.177, 5.814]
South	1.120	[0.438, 2.868]
Age	0.957	[0.706, 1.298]
BMI percentile	0.950**	[0.920, 0.980]
WBV		
Peer	0.370***	[0.241, 0.568]
Friend	1.102	[0.763, 1.591]
Teacher	1.022	[0.668, 1.564]
PE/sports coach	0.906	[0.570, 1.440]

Note. OR = odds ratio; CI = confidence interval; BMI = body mass index; WBV = weight-based victimization; PE = physical education.

^aThe sex reference group is male. ^bThe race/ethnicity reference group is White. ^cThe region reference group is North.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Regression Analyses Predicting Academic Grades

Effects of WBV from Peers and Other Sources

Table 2 displays the summary of the regression models testing the effects of school-based WBV from different sources on academic grades. Controlling for sex, race/ethnicity, region, and age, a significant negative association between BMI percentile and grades emerged, such that adolescents with higher BMI reported receiving lower academic grades ($OR = .950$, 95% CI [.920, .980]). When considering the effects of WBV from different sources, it was only WBV from peers that exerted significant independent effects ($OR = .370$, 95% CI [.241, .568]), controlling for WBV from all other sources. Specifically, greater frequency of

experiencing WBV from peers at school was associated with receiving lower grades. Given that the negative link between WBV and grades appears to be driven by peer perpetration, we focus subsequently on the potential of teachers to mitigate this association.

Effects of Teacher Helpfulness and WBV Reporting Frequency

The summary of the second set of regression models is shown in Table 3. As indicated by the main effects model (Model 1), over and above the significant negative effects of BMI and peer WBV, students who perceived their teachers to be more helpful in preventing future peer WBV had higher academic grades ($OR = 1.822$, 95% CI [1.088, 3.052]). However, the frequency with which students reported experiences of WBV to teachers was unrelated to their grades ($OR = 1.001$, 95% CI [.584, 1.715]).

Model 2 depicts the interactive effects of teacher helpfulness. A significant interaction was revealed between peer WBV and teacher helpfulness ($OR = 2.106$, 95% CI [1.249, 3.549]). Tests of simple slopes indicated that the association between peer WBV and academic grades was stronger when students perceived their teachers to be less helpful (i.e., $-1 SD$; log odds = -1.772 , $p < .001$), and weaker when students perceived their teachers to be more helpful (i.e., $+1 SD$; log odds = $-.670$, $p = .009$). Finally, the interaction between peer WBV and frequency of reporting WBV to teachers (shown in Model 3) was nonsignificant ($OR = 1.297$, 95% CI [.732, 2.296]). Taken together, the association between peer WBV and academic grades varied across students depending on the extent to which they perceived their teachers to be helpful in preventing future peer WBV, while the degree to which students reported WBV to teachers was unrelated to the academic implications of peer WBV.

Discussion

Given the high prevalence of WBV in schools (Bucchianeri et al., 2013), particularly among adolescents with high body

Table 3
Regression (Ordinal) of Academic Grades on Peer Weight-Based Victimization, Teacher Helpfulness, and Reporting Frequency

Predictor	Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI
Sex ^a						
Female	1.068	[0.483, 2.362]	1.164	[0.510, 2.654]	0.995	[0.441, 2.242]
Race/ethnicity ^b						
Non-White	0.418	[0.105, 1.664]	0.347	[0.091, 1.325]	0.399	[0.100, 1.587]
Region ^c						
West	2.307*	[1.033, 5.154]	2.834*	[1.229, 6.533]	2.210	[0.980, 4.984]
South	1.061	[0.405, 2.781]	1.227	[0.454, 3.318]	1.020	[0.390, 2.670]
Age	0.959	[0.709, 1.297]	1.001	[0.736, 1.361]	0.968	[0.714, 1.313]
BMI percentile	0.955**	[0.928, 0.983]	0.953**	[0.925, 0.981]	0.954**	[0.927, 0.982]
Peer WBV	0.354***	[0.228, 0.549]	0.295***	[0.183, 0.475]	0.357***	[0.228, 0.559]
Teacher helpfulness	1.822*	[1.088, 3.052]	2.246**	[1.306, 3.860]	1.644	[0.939, 2.879]
WBV reporting frequency	1.001	[0.584, 1.715]	0.718	[0.395, 1.304]	1.060	[0.605, 1.856]
Interaction effects						
Peer WBV × Teacher Helpfulness			2.106**	[1.249, 3.549]		
Peer WBV × Reporting Frequency					1.297	[0.732, 2.296]

Note. OR = odds ratio; CI = confidence interval; BMI = body mass index; WBV = weight-based victimization; PE = physical education.

^aThe sex reference group is male. ^bThe race/ethnicity reference group is White. ^cThe region reference group is North.

* $p < .05$. ** $p < .01$. *** $p < .001$.

weight (Puhl et al., 2011), and the academic toll of such mistreatment (Krukowski et al., 2009; Lessard et al., 2020), it is important to consider the role of teachers in supporting the schooling success of students experiencing WBV. Although past research has linked WBV to underachievement (Krukowski et al., 2009; Puhl & Luedicke, 2012), this study is among the first to test the relative contributions of WBV from different sources at school to academic grades. Notably, our findings indicate that, despite the relative frequency of WBV from friends, teachers, and coaches at school, the link between WBV and lower grades is driven primarily by WBV from peers. During a developmental period when peers take on heightened academic importance (Juvonen et al., 2012), WBV is likely to limit opportunities to receive direct academic assistance from peers (e.g., homework help) as well as drain cognitive resources (e.g., heightened concern for safety) in ways that disrupt learning and compromise school performance (Juvonen et al., 2019).

Shedding light on mechanisms to reduce the academic consequences of peer WBV, a novel finding of the current study involves the buffering role of teachers. When students perceived their teachers to be more helpful in preventing future WBV, the negative effect of WBV on academic grades was reduced. While the moderating effects of teacher helpfulness are promising as they provide insight into a potential intervention point, our results also indicate that fewer than one in five students perceived their teachers to be helpful or very helpful in preventing future WBV. The question then is, how can we improve student perceptions of teacher helpfulness?

Cultivating an overall more inclusive weight climate within schools may be an important first step (Lessard & Juvonen, 2020). Indeed, in a study of general bullying, adolescents reported the most helpful teacher bullying intervention strategy was to “make the classroom so that bullying cannot happen by having the teacher know what is going on at all times” (Crothers & Kolbert, 2004; p. 24). Although our findings indicated that students were not academically better off when reporting WBV to teachers more frequently, such null effects may partially reflect teachers’ negative attitudes toward students with high body weight (Peterson et al., 2012). In other words, negative weight-related stereotypes held by educators (e.g., that students with high weight are lazy, self-indulgent; Peterson et al., 2012) may dissuade teachers from intervening in instances of WBV, even when such incidences are reported to them. Professional development within schools that addresses both teacher weight biases and best practices to support students experiencing WBV may therefore be critical, particularly given educators’ strong support for staff training to address WBV (Puhl et al., 2016).

This study has several limitations. First, we had no objective achievement data of academic performance, and victimization experiences were self-reported. The current findings should therefore be replicated using school records data and multi-informant victim reports (e.g., peer nomination data). Similarly, our measure of BMI was calculated using self-reported weight and height. Also, our indicators of perceived teacher helpfulness and WBV reporting frequency relied on single-item measures. Although the measures used in the current study provide important initial insight into teachers’ role in minimizing the academic consequences of WBV, additional research should be conducted with more comprehensive measures of teacher intervention strategies (cf. Puhl et al., 2013b). The present findings could also be better understood with additional information about the school context, such as the

overall weight climate and prevalence of weight-based victimization in the school (Lessard & Juvonen, 2020). Furthermore, all variables were assessed at a single time point and thus causality cannot be concluded. Longitudinal studies assessing academic grade changes over time as a function of WBV experiences and teacher support will be an important avenue for future research.

Finally, our sample was limited to adolescents attending weight-loss camp. While this approach was purposeful to capture the experiences of youth who may be most vulnerable to WBV, it is possible that those attending weight-loss camps may have more support compared with others. Moreover, given the cost of attending weight-loss camp and that the sample was largely White, we cannot presume our findings generalize across racial/ethnic and socioeconomic groups. Particularly given higher rates of obesity among African American and Hispanic youth relative to their White counterparts (Ogden et al., 2018), and among youth from lower, compared to higher, socioeconomic backgrounds (Frederick et al., 2014), it is important for future work to be conducted among more racially/ethnically and socioeconomically diverse samples.

Despite these limitations, our study also has important strengths, including assessment of multiple sources of WBV in the school setting, which allowed for novel comparisons between different sources of WBV and academic grades. Our study also offers unique insights about potential barriers in reporting WBV to teachers, and sheds light on previously unstudied relationships, including a possible buffering role for teachers to help mitigate the academic consequences of WBV.

Conclusion and Implications

Understanding mechanisms to support the schooling success of adolescents with high weight is particularly important in light of weight-based disparities in educational attainment (French et al., 2018) and longer-term socioeconomic disparities (Newton et al., 2017). Our study results underscore the detrimental effects of peer WBV and highlight the important role teachers play in mitigating the academic consequences of such mistreatment. Given the overall low levels of perceived teacher helpfulness reported by students, school psychologists and administrators should encourage consistent teacher intervention during incidents of peer WBV and provide teachers with specific resources to support weight-victimized students, as well as professional development to raise awareness of the harmful consequences of WBV.

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Received April 27, 2020

Revision received October 23, 2020

Accepted November 5, 2020 ■